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HIGH-PERFORMANCE COMPUTING

FEBRUARY 2007



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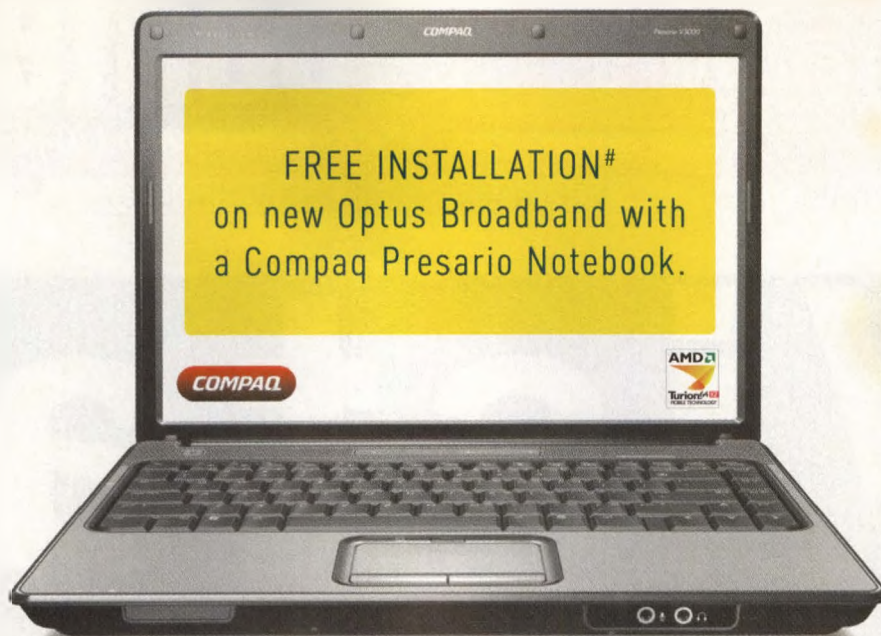
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Vista

upgrade superguide

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Here it is. Your official APC guide on how to get Windows Vista up and running on your system right now! Turn to page 49 right away to get started.



DEFEND YOURSELF!
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TONY SARNO

Late January, two weeks after this issue of APC hits the newsstands, you'll finally be able to buy your first copy of Windows Vista. With power users breaking up into the usual OS tribes, the new operating system won't be universally welcomed. Linux devotees will claim Linux is just as good (and it's free). Mac fans will say Leopard already pre-dates much of Vista's new features (including the Aero interface). And some XP users may wonder why they need to upgrade to something that on the surface looks just like a fancier interface on XP.

But here's my tip: the silent majority will again flood into the retail stores to get their first copy at the end of this month. They will do this because Windows XP, which launched in October 2001, is now five years old — and that's an eternity in IT terms (particularly when XP was so hopelessly unprepared for the internet age that it has since required a battery of third party security software — see our Security Roundup on page 42 — in order to avoid being swamped by viruses, malware and assorted firewall intuders).

It really is time for a contemporary OS, and Vista delivers. In this month's special on upgrading your PC to Vista, we list ten reasons why you should care about Vista. When we discussed the reasons to migrate to Vista amongst ourselves in the office, we found we all

had a different one. Mine are better security, navigation and driver handling — plus the prospect of six months of obsessive exploration of every nook and cranny in the new OS.

But will I use Vista by itself? No. And I think this reflects what many APC readers will do. I will run Vista, keep XP and continue to use Linux. I have no particular fondness for XP, but I need it because right now most of my current-generation video-editing apps just don't run on the new OS. I will also keep using Suse for no other reason than I like it, since it's taken me years to fill my distro will all the necessary add-ons, utilities and other features to make it usable as a desktop OS (in fact we've got a whole series from Ashton Mills on this, on page 92).

Whether it's Vista and XP or Vista and Linux, I think a lot of APC readers will want to run two OSs, so I called our Windows specialist James Bannan to give us a tutorial on dual-booting Vista (page 74). Dual-booting it with XP is fairly straightforward, which is not surprising given that they're from the same family. It's when it comes to Linux that Vista plays nasty, contemptuously overwriting any pre-existing Linux bootloader so that Vista boots — and your Linux goes missing. But there's ways of fixing this (and our tutorials will show you how).

Happy exploring of the new OS.

tsarno@acpmagazines.com.au



WHETHER IT'S VISTA AND XP OR VISTA AND LINUX, I THINK A LOT OF APC READERS WILL WANT TO RUN TWO OSs

STAFF FILE

Name: Tim Gaden **Favourite things:** Nokia E60, Collapsible Fisher Space Pen, Moleskine notebook, MacBook Pro, credit card on the wife's account. . .

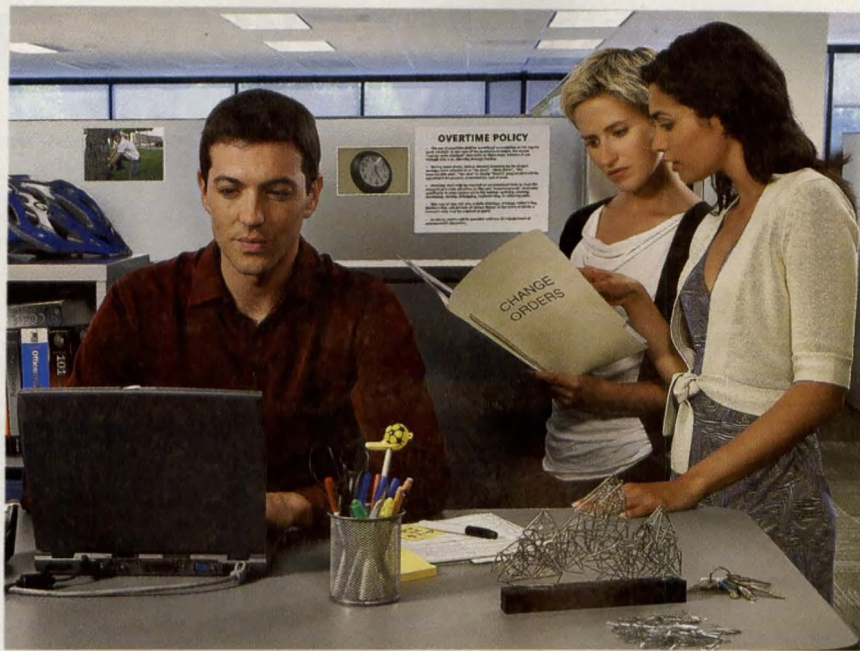
Tim is probably the last Mac journo on the planet without an iPod. Incredibly, for a Mac guy, Tim's first PC was an IBM XT: an original with the two fat 5.5in floppy drives and a mono monitor. He just couldn't believe how powerful a tool it was for thesis writing. There was nothing it and WordPerfect 4.2 couldn't do. Looking back on it now, it was a piece of junk, but it gave him a gift that has stayed with him for life: a conviction that computers are amazing tools for getting things done. Tim's never been in love with technology for its own sake, but he is still besotted with the way it can make work easier, faster and more elegant. He says it's only natural that he's a Mac user.

Like other writers at APC, Tim began tech writing for Whirlpool, the Australian broadband web site, where he cut his teeth on consumer advocacy and the ever-increasing range of things that broadband technology helps people do. Tim caught the writing bug and wanted to churn out more stuff than Whirlpool could run. A blog followed, www.hawkwings.net, the only blog in the world focused on Apple Mail. It proved surprisingly popular and led to an invitation to write occasional pieces for APC.

These days, Tim writes for TechNotes in the magazine and the X-Factor blog for APC's web site (www.apcmag.com). When he's not writing for APC, Tim is doing doing writing of a different kind — as a research fellow at a college within the University of Melbourne.



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Another Editor's Choice Award from TOM'S HARDWARE GUIDE

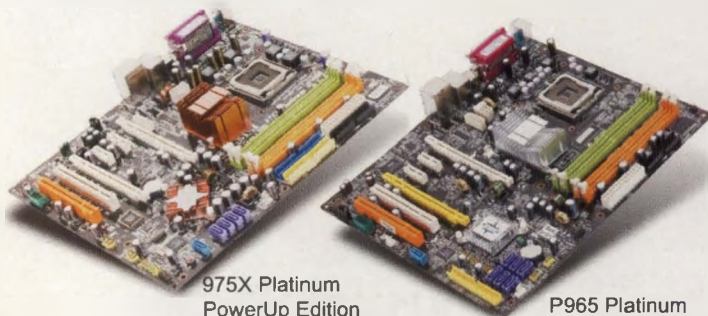


Tom's Hardware Guide is a U.S. based website expertising in computer hardware news and reviews for a decade. Their reviews and awards have been seen valuable because of their professional and impartial testings. MSI is proud to receiving 2 Editor's Choice Awards from Tom's Hardware in continuously two months: 975X Platinum on 11 October and P965 Platinum on 13 November.

MSI 975X Platinum PowerUp Edition has received the two thumbs up from Tom's Hardware Guide October Issue - "Four 975X Motherboards for Core 2 Duo".

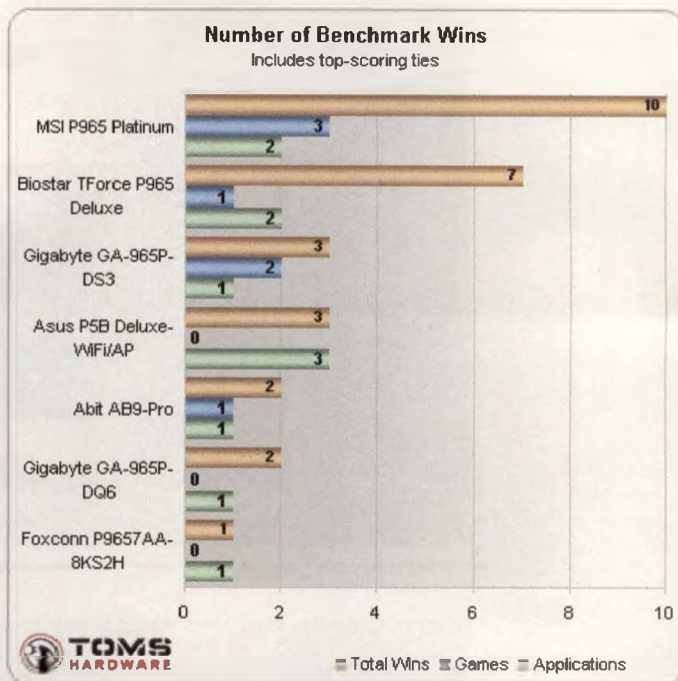
"You should also have a look at the MSI 975X Platinum Power Up Edition, because it offers more for the same money. It ran properly at 333 MHz (FSB1333) system speed, and allowed us to overclock the Core 2 Duo E6700 from 2.66 GHz to 3.0 GHz easily. Obviously, MSI got a grip on its former issues. Due to its superior price / performance ratio, we recommend the 975X Platinum PowerUp Edition at this time."

(http://www.tomshardware.com/2006/10/11/four_975x_motherboards_for_core_2_duo/, 11/10/2006)



975X Platinum
PowerUp Edition

P965 Platinum



"Number of Bench Mark Wins" Table from Tom's Hardware Guide (http://www.tomshardware.com/2006/11/13/shootout_at_the_core_2_corral/page20.html, 13/11/2006)

Besides 975X Platinum, MSI P965 Platinum has also won Editor's Choice Award from Toms Hardware Guide - "Shootout at the Core 2 Corral : Seven P965 Motherboards Compared roundup," beating six other boards from 5 different vendors.

"MSI is the clear performance leader, also scoring the highest number of game wins..... Equally surprising is that the two most expensive boards - the Asus P5B Deluxe WiFi-AP and Gigabyte GA-965P-QD6 - took no game wins,The clear winner in performance testing and the mid-market value leader, the MSI P965 Platinum competes with high-priced models on features,....."

(http://www.tomshardware.com/2006/11/13/shootout_at_the_core_2_corral/index.html, 13/11/2006)



Is Vista pricing a rip-off in Australia?



You could save between \$54 and \$217 by mail-ordering Vista from the US, rather than buying it here. *Dan Warne reports.*

We analysed Vista's pricing in detail, first comparing both the US dollar cost converted to Australian dollars (depressing), as well as an adjusted price, factoring in the profit margin Microsoft Australia previously applied to XP's Australian pricing.

Our calculations showed that while XP was 1.66 times more expensive in Australia than in the US, Vista is up to a whopping 1.91 times more expensive, depending on the version.

So what's in it for Aussies to buy it locally, other than supporting our industry? And why is Australian Vista pricing jacked up so much compared to XP? We asked Microsoft Australia's Windows boss, Jeff Putt.

After weeks of deliberation, Putt responded on behalf of Microsoft that the Vista RRP was a guide for retailers only: that it was more expensive to do business in Australia and the Vista costs had

been calculated on the same basis as XP; that the base price for Vista is the same worldwide once

exchange rates are applied and that the US Estimated Retail Price (ERP) doesn't include tax, while the

Australian one does. The last point is more than fair — but doesn't explain away the fact that Australians can order a copy of Vista from the States without paying US sales tax, while also taking advantage of the Australian Government's policy of GST-free personal importation of products below \$1,000 (see <http://snipurl.com/13s1k>).

Putt also argued that: "There are many benefits to buying from local retailers including local product exchange, local market warranty conditions, local returns and added-value services."

We asked what these "value added services" for Australians were and Putt said he meant, for example, a computer shop installing the software for customers.

What do you think? Is Microsoft Australia's pricing (up to \$751 for Vista Ultimate) fair?
epinions@acpmagazines.com.au

COST TO ORDER VISTA FROM THE US

	\$USD ERP	P&H (\$USD)	Converted to SAUD	Saving over Aust. RRP
Business Full	\$299	\$12	\$404	\$161
Business Upg	\$199	\$12	\$274	\$105
Home Premium Full	\$239	\$12	\$326	\$129
Home Premium Upg	\$159	\$12	\$222	\$77
Home Basic Full	\$199	\$12	\$274	\$111
Home Basic Full Upg	\$99.95	\$12	\$146	\$54
Ultimate Full	\$399	\$12	\$534	\$217
Ultimate Full Upg	\$259	\$12	\$352	\$143

Using \$1.30 as the US-AUD exchange rate as at 11/10/2006. P&H cost sourced from emsoftwaredeal.com

Aussies miss out on free Vista, Office

Microsoft is giving away tens of thousands of free copies of Vista and Office 2007 to anyone who wants them... as long as they live in the USA.

All someone in the US has to do to claim their thousand-dollars' worth of free software is watch three promotional videos on each of the products at the web site <http://powertogether.com> before 28 February.

Microsoft Australia isn't showing the same largesse. Windows chief, Jeff Putt, seemed bemused by the offer from Redmond and said he had

no plan to give away his products free of charge here.

Microsoft's generosity may be explained by a desire to get a large number of people using Office 2007's new file formats which are incompatible with previous versions of Office. As those documents are emailed around, there will be a natural pressure on the receivers to buy an Office 2007 upgrade.

Another possibility for the giveaway could be Microsoft realises that tech enthusiast early adopters are going to find a way to pirate the products no matter what, so it may as well give them a free copy — and along the way indoctrinate them with features and benefits so they can influence friends, family and colleagues.

Dan Warne



THE (A)PC REVOLUTION

February 1987



FIRST AUSTRALIAN DYNAMAC BENCHMARK

For those who can wait no longer for Apple to release a lap-held version of the Macintosh, there's an alternative. Nick Walker assesses the 9.9kg Dynamac, a flat Mac with 1MB RAM, a 40MB hard disk and an electro-luminescent screen. The internal design is the epitome of high-end, lap-held design. The only remaining space, in the centre of the machine, has already been accounted for; an optional tape streamer will be available to fit it. Basic system US\$4,995, fully optioned US\$10,475. Available directly from Dynamac Computer Products of Golden, Colorado.

IBM PC/RT – WHO'S GOING TO USE IT?

The IBM PC/RT is a 32-bit RISC machine which is fast and responsive in single-user mode. But what does it offer that can't be achieved with a Unix multi-user/AT clone single-user combination?

HELLO, I AM A DORK

This ad for the government utility Telecom Australia (top left) says it all, really. We're not quite sure what message the guy with the Viatec terminal for his head was meant to convey: artificial intelligence built into Telstra's text-based info system, or that people who use it are big dorks?

US-RUSSIAN DEAL TO SILENCE MP3

The infamous music download site **allofmp3.com** will be shut down after a deal was reached in late 2006 between the USA and Russia over copyright protection.

The agreement, which smooths the way for Russia to enter the World Trade Organisation, covers a variety of copyright infringements ranging from the theft of pharmaceutical test data to the illegal copying and marketing of CD-ROMs. It specifically names **allofmp3.com** as a well-known example of the

many web sites "that permit the illegal distribution of music and other copyright works".

The site began operation in 2000 and is estimated to have an annual turnover of \$38 million. It has a licence agreement with the Russian equivalent of the Recording Industry Association of America, which it claims allows for the legal distribution of music from any artist or recording label.

The US-Russia agreement now says that copyright bodies in Russia will be prevented from collecting royalties for music that the music's rights holder hasn't specifically authorised.

Allofmp3.com's enormous popularity has seen the site rise to membership of the top 1,000 web sites worldwide (as determined by the web information company Alexa) and to capture as much as

14% of the music download market in the UK.

The big drawcard is price. Downloading a song from Apple's iTunes Music Store costs \$1.69; from **allofmp3.com** it costs only \$0.15, and the user gets a choice of bit rates. User discounts can reduce price even further.

The site claims to send "voluntary" royalties to musicians, but artists around the world deny ever receiving such payments.

The agreement says that both governments will cooperate on "shutting down" the site, although it is possible that the site will seek to reach agreements with international industry bodies. This would ensure the site's survival, but substantially narrow the price differential with other online music providers.

Tim Gaden

Email pushes onto mobile phones

BlackBerry-maker RIM, Google and Telstra to fight it out for top-notch mobile email services.

BlackBerry's entry into the space is the BlackBerry Pearl (8100), which combines the company's polished push email system with a 1.3MP camera, a micro-SD card slot for up to 2GB storage and the ability to play music in MP3 and AAC format, plus videos at a frame rate that looks as good as an iPod video.

Its name comes from a unique pearl-sized glowing trackball above the keypad (allowing 360° navigation).

Google is in hot pursuit with a free Java app that can run on most mobiles and provides a reasonably snappy interface to Gmail. It pre-loads messages before a user views them, for faster performance. But, it only loads the first five or so mails in your mailbox, so it economises on data transfer. Its other killer feature is the ability to search an entire Gmail mailbox through your mobile.

Telstra BigPond chief Justin Milne says he is working on a personal mobile that will compete with BlackBerry-type devices and tie in closely with BigPond internet accounts. Telstra recently released the HipTop (reviewed in APC January, page 64), but Milne says this isn't the device he's been working on.

Dan Warne



MOBILE EMAIL PLANS

Optus BlackBerry Unlimited	\$39.95*
Telstra BlackBerry Unlimited	\$39.95*
Vodafone BlackBerry Unlimited	\$39.95*
Telstra BlackBerry Unlimited	\$29.95**
Vodafone 100MB data pack (for non-BlackBerry phones)	\$29.95***
3 200MB mobile web cap	\$29.95****
Optus BlackBerry Cap (\$300 voice calls, unlimited BlackBerry data)	\$79.00*****

* 24-month contract (\$49.95 if no contract).

** Must spend \$120/mth on voice plan.

*** Only available with business phone plans.

**** 200MB only in 3G coverage; 2MB of GPRS usage and \$1.65 per MB thereafter.

***** 24-month contract. Not available off contract.



Microsoft urges corporates to offer 2GB mailboxes

Finding it hard to resist Gmail's storage? Microsoft is promising multi-gig mailboxes in Exchange 2007.

Microsoft is fighting the trend for corporate employees to duck IT policies and forward their work email to Gmail. The software giant is urging employers to increase mailbox sizes to 2GB or more.

IT departments have traditionally applied such restrictive limits to Exchange Server mailboxes (as low as 25MB per staff member) that users have become frustrated with repeated "your mailbox is full" errors. Meanwhile, only senior execs have been granted access to work email from home or via a Blackberry.

As a result, more and more users are auto-forwarding all their email to Gmail, where they have a 2.7GB mailbox capacity and can access it wherever they are — even via a mobile phone.

While the slumbering giant in corporate IT may not yet have woken up to the data security risks

associated with this practice, Microsoft presumably realises that if it goes on unchecked, Exchange Server will eventually become expendable.

As a result, Exchange 2007 includes a number of features that Microsoft says makes the 2GB corporate mailbox not only completely viable, but desirable.

Speaking at the launch of Vista, Office and Exchange in Singapore, Exchange product marketing manager Martha DeAmicis said clustered replication capability means one exchange server (not necessarily in the same location) can back up another exchange server automatically. As a result, companies don't have the burden of backing up to tape every night — a slow and expensive process that means mailbox size has to be kept to a minimum.

Exchange Server 2007 includes a server-equivalent of Windows Desktop Search that pre-indexes all mailboxes 35 times faster than Exchange 2003, so searches in Outlook are dramatically faster.

And the kicker is in the yet-to-be-released Windows Mobile 6.0 — codenamed Crossbow (taking aim at BlackBerry perhaps?) — which allows users to search their entire 2GB+ Outlook mailbox via their mobile. They can then draw down any message instantly, even if it's not stored on the mobile.

DeAmicis said Microsoft had raised the capacity for each Exchange server from 3,500 to 5,000 users, and because it was now 64-bit only, all Exchange servers could access 32GB of RAM, improving caching of very large mailboxes.

Dan Warne

SCAMMING THE SCAMMER, PART 573

Phishing is going retro, it seems, with the latest scammers trying their luck by phoning people randomly and telling them they've won an expensive prize in a competition they've never entered. Of course, there's just one condition...

A user of the Whirlpool broadband forum got the call offering him a free, late-model Samsung mobile phone. He played the scammer along until she admitted that he had to pay a \$52 "delivery fee" for the privilege of winning this mobile. If only he would hand over his credit card details, it was a small price to pay

for having been selected "at random from all the phone numbers in the world".

When he declined, the scammer unleashed a stream of abuse and threats of legal action for breach of a non-existent contract.

Unfortunately for the scammer, the victim already had a pretty up-to-date mobile phone; one which, at the click of a button, could record the whole call, say, for posting online for "all of the internet users in the world".

Listen for yourself: <http://snipurl.com/13ohf>.

Tim Gaden

inbrief



MOORE'S LAW'S DEAD, SAYS MOORE

Gordon Moore, 76, the scientist who coined "Moore's Law", stating that transistor density on integrated circuits doubles about every two years, has changed his mind. He says that's unsustainable. Chip giant Intel lives by the law and recently invested considerable funds in buying an original copy of the 1965 edition of *Electronics* magazine that contained the first published instance of the law.

MOBILE TOWER IN YOUR HOUSE?

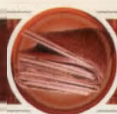
So you like the idea of a VoIP phone you can use anywhere there's Wi-Fi? Straight from the "clutching desperately to straws" department, mobile network supplier Ericsson has announced a small mobile phone tower for home use — the "Ericsson Home 3G Access Point". It would be connected to a home broadband connection and allow you to use your 3G/HSDPA mobile at home for cheap calls and internet. Given the persistent fears about the health risks associated with mobile tower signals, we think this innovation will fly like a lead balloon.

OUTLOOK 2007 GETS SMS

Microsoft has built SMS sending into Outlook 2007 and is setting up partnerships with telcos all around the world. None are ready to go in Australia yet. Carriers have to install special Microsoft software in their network. Most already provide a range of PC-based messaging solutions, so it may be a hard sell for Microsoft.



Want to nominate a dumbest moment in tech? Send an email with the subject line "Dumbest Moments" to dwarne@apcmagazines.com.au. All correspondence becomes the property of APC.



Extreme geek

A PC in a jewellery box for less than \$100?

Lyle Stone: saving \$\$\$ and the environment, one jam PC at a time.

Lyle Stone is a bit of a hippy at heart. When he needed a PC to support his guitar-playing habit, he decided to build his own using "an old jewellery box, some elbow grease and a truckload of garage sales." The end result has the earthy, wooden tones that make a hippy smile and cost Lyle less than a year's subscription to APC (and fits on the end of a coffee table).

The case cost him \$10 at an op shop. After cutting out the back with a Leatherman pocketknife, Lyle was able to squeeze in an old HP Pavilion mini ATX motherboard. With onboard graphics and sound, 384MB of leftover RAM and costing only twenty bucks from a local garage sale, it happily runs the computer's 633MHz CPU.

An old IBM laptop 2.5 inch hard drive cost him \$50 at a computer fair, more than the rest of the project put together.

The jewellery box form factor provides no room for

fancy add-ons like a CD-ROM or floppy drive. Everything comes in and out via a USB stick, although he does have an Ethernet card with the metal strip removed to save space that he hopes to squeeze in somewhere. The PC is rounded off with a set of three no-name

speakers (\$10, garage sale) and an old Logitech keyboard and mouse.

Lyle says that anyone can do the same. He recommends it. It saves money, saves the environment, saves space, saves electricity and makes your inner hippy geek happy.

Tim Gaden



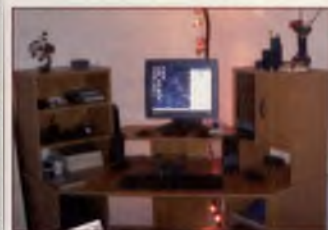
In the studio: Lyle with his jewellery box small form factor.



Utilitarian: who knew jewellery boxes would make the ideal cheap PC case?



Cooling is simple but effective: if the box gets too hot, just lift up the lid!



Lyle's power supply is a small HP unit which sits discreetly behind the box.

HOW GEEKY ARE YOU?

Have you wired up your car? Shared your home media library with five family members in three states? Made a 16 terabyte file server? If you've done something interesting with computing technology, APC wants to hear about it. Email a description of your project to dwarne@acpmagazines.com.au and include photos (we need at least one of you pictured with your gear). This month's Extreme Geek wins a NETGEAR WNR834B

RangeMax NEXT Wireless Router and a WN511B RangeMax NEXT Wireless Notebook Adapter (worth \$528 in total). This combination delivers unprecedented wireless speeds and complies with the draft 802.11n wireless standard. The RangeMax NEXT line offers users speeds 15 times greater than standard 802.11g products (with 10 times more wireless coverage). For more detail on NETGEAR, visit www.netgear.com.au.

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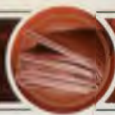
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Microsoft



THE creators



THE TV down your Broadband LINE

Erich Stumpf has the technology to deliver next-gen TV via your broadband line. It's just waiting for commercial and governmental action, he tells *Adam Turner*.

While most people might keep a trophy or some other knick-knack on display, a 10-year-old DSLAM takes pride of place on the bookshelf in Erich Stumpf's office.

Designed to sit in a telephone exchange and enable Digital Subscriber Line (DSL) broadband internet access over phone lines, this particular DSLAM was one of the first video-enabled prototypes produced at NEC's global DSL development centre in Melbourne.

Stumpf runs the centre (with the original DSLAM watching silently over his shoulder) as his team designs the equipment that will deliver the next-generation of internet services to the world. The fact that, a decade later, Stumpf could take the old DSLAM from the shelf and install it at his local telephone exchange — knowing it would still handle cutting edge technologies such as Internet

Protocol Television (IPTV) — is one of his proudest achievements.

Chief engineer and head of the broadband products division of NEC's Telecommunications Network Systems group, Stumpf is a chief architect of the company's video-enabled DSL technology.

Internet Protocol Television threatens the stranglehold traditional broadcasters have on our viewing habits by delivering broadcast-quality live TV and video on demand to households over data links.

The largest IPTV deployment in the world, providing pay TV via DSL to more than 650,000 subscribers in Hong Kong, runs on a platform developed by Stumpf's team of 75 people in Mulgrave.

LIGHTING THE WAY FORWARD

Stumpf has an engineering degree with honours and a PhD

in optoelectronics — the study of converting electrical pulses into beams of light and vice versa. He was also involved in the early stages of Australian research into fibre-optics — the transmission of data, embedded in light beams, through long strands of plastic or glass.

While lecturing in optoelectronics and microwaves at La Trobe University in 1992, Stumpf was contracted by NEC to work on a fibre-optic telephony system for Telstra. He then resigned from the University to work for NEC on initial Passive Optical Network trials including Telstra's fibre-to-the-home trial in Wollongong in the early 1990s.

The expense of fibre-optics saw Telstra turn its attention to DSL, which can deliver data over existing copper telephone lines. NEC also turned to the technology and the DSLAM on Stumpf's shelf was born.

While Stumpf worked on an NEC trial of video on demand via DSL for Telstra, the telco giant's pay TV arm Foxtel had already settled on an encryption system that wasn't DSL-compatible. As a result, both Telstra and Optus rolled out Hybrid Fibre Coaxial cable networks in the mid-1990s which formed the backbone of their internet and pay TV networks in most Australian capital cities.

While DSL has the potential to reach every home within several kilometres of a telephone exchange, the HFC cable networks are only available to those lucky enough to have the cable run down their street.

The great cable rollouts soon ground to a halt — leaving many suburbs with two cables in one street and none in the next. This gap between the high-speed haves and have-nots was later breached

A decade old technology, video-enabled DSLAM can still keep pace today. ▶

by DSL, but only for internet access and not pay TV.

Meanwhile Stumpf's team at NEC turned its attention abroad, using DSL technology developed for Australia to provide pay TV and internet services across Asia. More than a decade after Telstra's fibre-to-the-home trial, as DSL reaches its limits, Stumpf's original hopes of a national fibre-optic network are still a pipe dream.

"The move away from fibre-optics was probably a missed opportunity," Stumpf says, "yet the people manufacturing the optical fibre and the components around it couldn't make them cheap enough to make it a deployable solution.

"DSL kept track for a while with people's bandwidth needs, but once people have got the appetite for bandwidth they want more and more. Now I think people have gone beyond the bandwidth that DSL can provide, so years later there's another opportunity for fibre to come in."

LOOKING BEHIND THE CURTAIN

Stumpf is also driven by the fact that he's an end user of the services he helps enable. While he doesn't consider himself a "gadget person", the Stumpf household is broadband-enabled and has embraced the digital lifestyle whole heartedly.

They shop online and are far more inclined to reach for the keyboard and mouse before the paper, telephone book or TV guide. Whereas Stumpf would pull apart the family television when he was a kid, today his son pulls apart the family PC and has even built a computer into his car — complete with a Wi-Fi link to the house.

The 49-year-old engineer still finds pleasure in the ability to solve



AS DSL REACHES ITS LIMITS, STUMPF'S ORIGINAL HOPES OF A NATIONAL FIBRE-OPTIC NETWORK ARE STILL A PIPE DREAM

problems and figure out what makes things tick.

"When you get something together and it actually works, whether it be your parents' television or something a bit more grand, that gives you a big buzz and then that drives you on. Even so, I don't think I'm that much of a gadget person. I'm more of an ideas person, coming up with new concepts or new ways of thinking about how to implement something," he says.

"Even though I'm the head of this division, I still like to get my hands dirty. I think you've got to draw a balance between the two. I've done a number of management courses and things like project management but, I think if I disconnected from the engineering side of things, I'd just be another manager. Stepping back at a certain

point and letting other people do the work is sometimes a bit difficult, actually."

It's thanks to Stumpf's hands-on approach and foresight that the technology to support IPTV already lies unutilised in Telstra's DSL network — in DSLAMS built by NEC. "We can deploy IPTV at any stage: the equipment Telstra has in its exchanges can be turned on in a very short time," he says.

The technology developed by Stumpf also allows providers to offer the holy grail of telecommunications, the "triple-play" of delivering voice, video and data over the one connection. Currently the only residential Australian triple-play services are delivered via the HFC cable networks and Canberra's TransACT Very High bit rate DSL (VHDSL) network, but this may change with

Telstra's talk of a fibre-to-the-node network, probably using DSL to cover the last mile and deliver gigabit data speeds.

While DSL is the bread and butter of Stumpf's research group, it hasn't put all its eggs in one basket and is working on Gigabit Passive Optical Networks (GPON) with NEC Japan. This offers the potential to deliver to users download speeds in tens of gigabits per second. Should Telstra build a fibre-to-the-node network, Stumpf is confident it will be based on this type of fibre-optic technology.

Meanwhile, Stumpf's decade-old DSLAM watches silently as Australia debates the future of the country's data infrastructure. Should it be called into service, it can still keep up with life in the fast lane. **2007**



Activate Vista!

Vista's Activation model requires every single copy of the new OS to be activated like non-volume Windows XP copies — but who really benefits?

In the lead-up to Vista's official release in November, Microsoft announced a brand-new feature which initially came as a bit of a shock — Volume Activation.

For Volume Licence customers, it turns out that the VL media we've all been using so far has been making use of Volume Activation 1.0. This is a slightly confusing name as, traditionally, VL products don't need to be activated at all. The new licensing model for VL customers is Volume Activation 2.0 and, currently, it's only applied to Windows Vista — Office 2007 retains the old activation model.

Volume Activation 2.0 means that every single copy of Windows Vista, regardless of the version, will have to be activated in the same way non-volume copies of Windows XP have to be activated. Even Volume Licence customers are not exempt — installations of Vista Business and Enterprise will require activation as well.

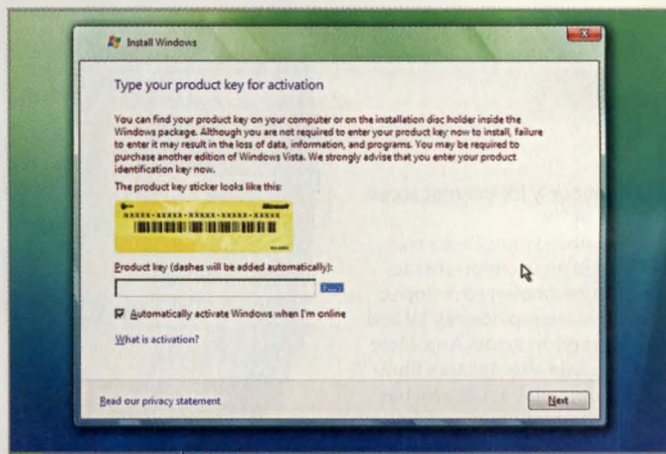
The reasoning at work behind this new system, according to Microsoft, is to:

1. Close significant piracy loopholes (Volume Licence keys represent the majority of keys involved in Windows piracy).
2. Improve the volume customer experience.

The first reason is completely acceptable. Illegal volume-licensed copies of Windows XP and 2003 Server are rampant on pirate boards, and Microsoft is perfectly within its rights to try and crack down on this. The second reason, however, is a bit harder to come to terms with. From a desktop admin perspective, one of the great things about working with volume-licensed products is that you often have to rebuild software images, and being able to work with the operating system software as if it was just another application gives you one less thing to worry about. So, while administrators will understand the need for Volume Activation 2.0, it's a bit rich for Microsoft to claim that they personally will benefit from it.

Instead of the traditional Volume Licence product key, Vista desktop administrators will have a choice of two types of new product key — MAK and KMS. Multiple Activation Keys (MAKs) are used to activate individual or groups of machines via a direct internet connection to Microsoft or over the phone through a Microsoft Activation Center. For Australian users, the numbers are (02) 9870 2131 or 1800 642 008.

MAK activation is done in one of two ways — proxy or independent. Proxy activation involves multiple PCs activating simultaneously via



one internet connection. Proxy activation is not available yet, but will be with the Volume Activation Management Tool (VAMT), released in 2007. Independent activation is just standard Windows activation.

Unfortunately for admins (and pirates), if you create an image from a MAK-activated machine, every new PC you create from that image has to be individually re-activated — you can't activate an image and propagate it. Each clone counts as a new, unactivated machine.

Key Management Service (KMS) allows businesses to administer activation in-house. All the Vista workstations installed with KMS Volume Licence keys connect to a single Vista workstation running

KMS in order to activate. At the moment, the KMS host has to be running Vista or Longhorn Server, but in 2007 Windows 2003 will be able to run KMS as well. To prevent someone bringing in their home computer, installing KMS-activated Vista and leaving again, each KMS-activated installation of Vista reconnects to the KMS host every 180 days to renew activation. If a KMS installation of Vista cannot connect to the host for thirty days, Vista goes into Reduced Functionality Mode (RFM).

And, unfortunately for small business, KMS is only available for businesses with at least 25 Vista machines. Anything less and MAK activation is the only option. **BT**



WHILE ADMINS UNDERSTAND THE NEED FOR VOLUME ACTIVATION 2.0, IT'S A BIT RICH FOR MICROSOFT TO CLAIM ADMINS WILL BENEFIT



HastalaVista

by
James Bannan

James Bannan is a systems manager at St Leonard's College (Vic) and APC's resident Windows expert. He'll be checking out Vista for you every month.

ASUS P5B-E Plus Overlocking Features

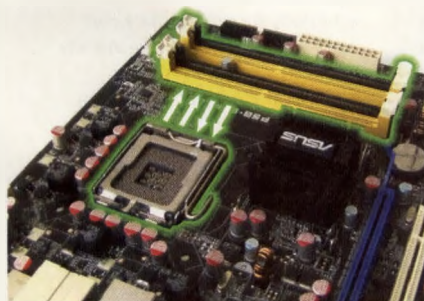
Push the Limit of Intel Quad-Core and Core 2 CPUs

ASUS recently introduced the P5B-E Plus motherboard, which has received excellent reviews from world-renowned IT media. Let's take this opportunity to look at several exclusive features that made the motherboard the overclocking beast of its class.

The P5B-E Plus motherboard supports the Intel Quad-core processor and the energy efficient Intel® Core™2 processor. It features the P965 chipset and supports the DDR2 800MHz dual-channel memory architecture. To provide the ideal foundation for a system that can bring out the real potential of these industry-leading specifications, the P5B-E Plus incorporated several exclusive features found only on ASUS motherboards.

PEG Link – Boost graphics card performance

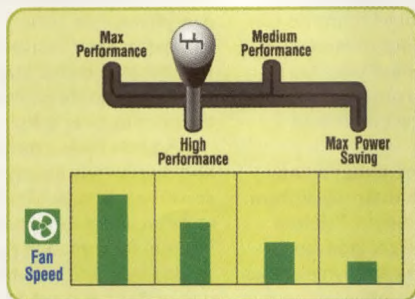
PEG (PCI Express Graphics) Link raises GPU and VGA memory throughput via the BIOS the same way system bus and system memory are tweaked, and offers powerful video performance on DX8 and DX9 applications. ASUS engineers carefully fine-tuned the parameters for PCI Express cards to provide system stability during high-speed graphics operation.



▲ PEG Link - Exclusive technology to boost up graphics card memory performance

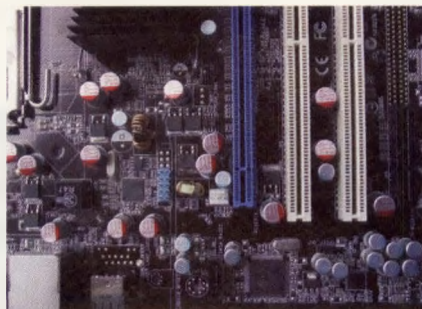
AI Gear - Optimize performance and quietness

To balance system performance and silent computing, AI Gear enables users to choose from profiles to adjust CPU frequency and vCore voltage, minimizing system noise and power consumption. Computing power, stability and scalability are the three main criteria for an ideal overclock Board, and the ASUS P5B-E Plus was developed with those in mind. If you're building a High performance system, then you'll definitely have to check out this ASUS board.



AI NOS – Real-time performance increase

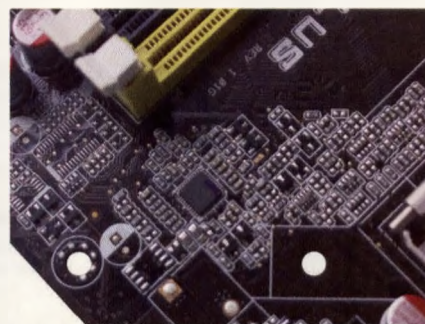
This intelligent overclocking system detects CPU loading through CPU power consumption, unlike mechanisms on other motherboards that rely on monitoring temperature changes. Based on processor operation, AI NOS raises FSB frequency without delay. It won't be affected by high-performance cooling systems that lower temperature when CPU is actually running at full power.



▲ Uses 100% all high-quality Conductive Polymer Capacitors

Stack Cool 2 – Effective and zero-noise cooling

Stack Cool 2 is a fan-less and zero-noise cooling solution offered exclusively by ASUS. It effectively transfers heat generated by the critical components to the other side of the specially designed PCB (printed circuit board) for effective heat dissipation.



▲ Stable power supply ensures system stability while overclocking

Q-Fan 2 – Adjusts fan speeds according to system loading

ASUS Q-Fan2 technology intelligently adjusts both CPU fan and chassis fan speeds according to system loading to ensure quiet, cool and efficient operation. It's an excellent innovation for balancing performance and silent computing.

If you are looking to upgrade your set up to a P965/Quad-Core motherboard, then definitely check out the ASUS P5B-E Plus. After all, why not squeeze every last drop of performance you have already paid for.



Psiphoning freedom

Do you see what I see? A new open source spin on anonymous web browsing could bypass government censorship of the web.

Aside from the issue of whether it's right to intercede on the territory of another government — which comes down to what extent you believe human rights take priority over government — when it comes to censorship, there are a number of ways to bypass government restrictions and open up the web to a wider audience that wouldn't normally have access to it.

Besides, censoring the internet is like trying to build a car without wheels — it's almost always a lost cause. It doesn't stop oppressive governments from trying though, because the alternative, of course, is to lose power.

Though by no means the only perpetrator, China is the most well-known for its censorship of the internet within its borders, a.k.a. the Great Firewall of China. Search engines such as Google and Yahoo!, and companies like Microsoft and Cisco, have all had to do business on the Government's terms. And there is no end of stories about sites coming and going from view within China — one of the more recent and visible examples being the Chinese Wikipedia, all at the whim of the Government.

If you think it's all hot air, try these two searches and compare:
• Go to www.google.com > Images and type in "Tiananmen Square".

• Go to www.google.cn, click Images and type in "Tiananmen Square".

(Hmm, where'd the tanks go? The result is the same searching in Mandarin and Cantonese).

Now imagine the extent to which information is censored so much that a population might not even know its own history. Not, at least, the one the government wants its people to know.

Which is why something as simple as punching holes in the firewalls of censored countries can make a tremendous difference to those trying to speak out, stay in touch with loved ones, or simply learn a world view not filtered by censorship.

And that's where the recently released Psiphon (<http://psiphon.civisec.org/>) comes in. Psiphon is an open source program and essentially a proxy anonymiser that anyone can set up, allowing people inside a restricted country to browse and communicate by accessing the net through local proxies run by everyday people like me and you.

While the idea isn't new — there are many such systems in existence (including Tor, <http://tor.eff.org/>) — the problem is frequently that the servers and proxies, usually

static in nature, can be blacklisted along with everything else. Tor is somewhat more resilient than this, but it still relies on central servers to choose pathways for the peer-to-peer links.

Psiphon takes a new approach and doesn't rely on any centralised servers at all. In fact, it allows any PC to be an uncensored gateway to the internet for someone else half a world away. And, additionally, this is so without the need for any special software on the client end (aside from a browser).

And because these "Psiphon nodes" are each independent and encrypt their connections (and can be anywhere in the world), there's no easy way to prevent this sort of circumvention of the firewall. Well, unless the said oppressive government wants

China just sees a red square, but it's blood red for the rest of the world.



to lock out the internet completely, that is.

It's telling that even in our connected online world, there are still ways to make a difference, in this case providing uncensored internet access for those living under a censored regime. Which, by the way, aren't always the obvious candidates. After all, if you were being censored, especially if it was subtle, how would you know it? We've already had our own Government's aborted and misplaced attempt at internet censorship. And, on that note, at the time of writing, the last episode of *The Glass House* screened this week... bit.ly



AFTER ALL, IF YOU WERE BEING CENSORED, ESPECIALLY IF IT WAS SUBTLE, HOW WOULD YOU KNOW IT?



LinuxWindow

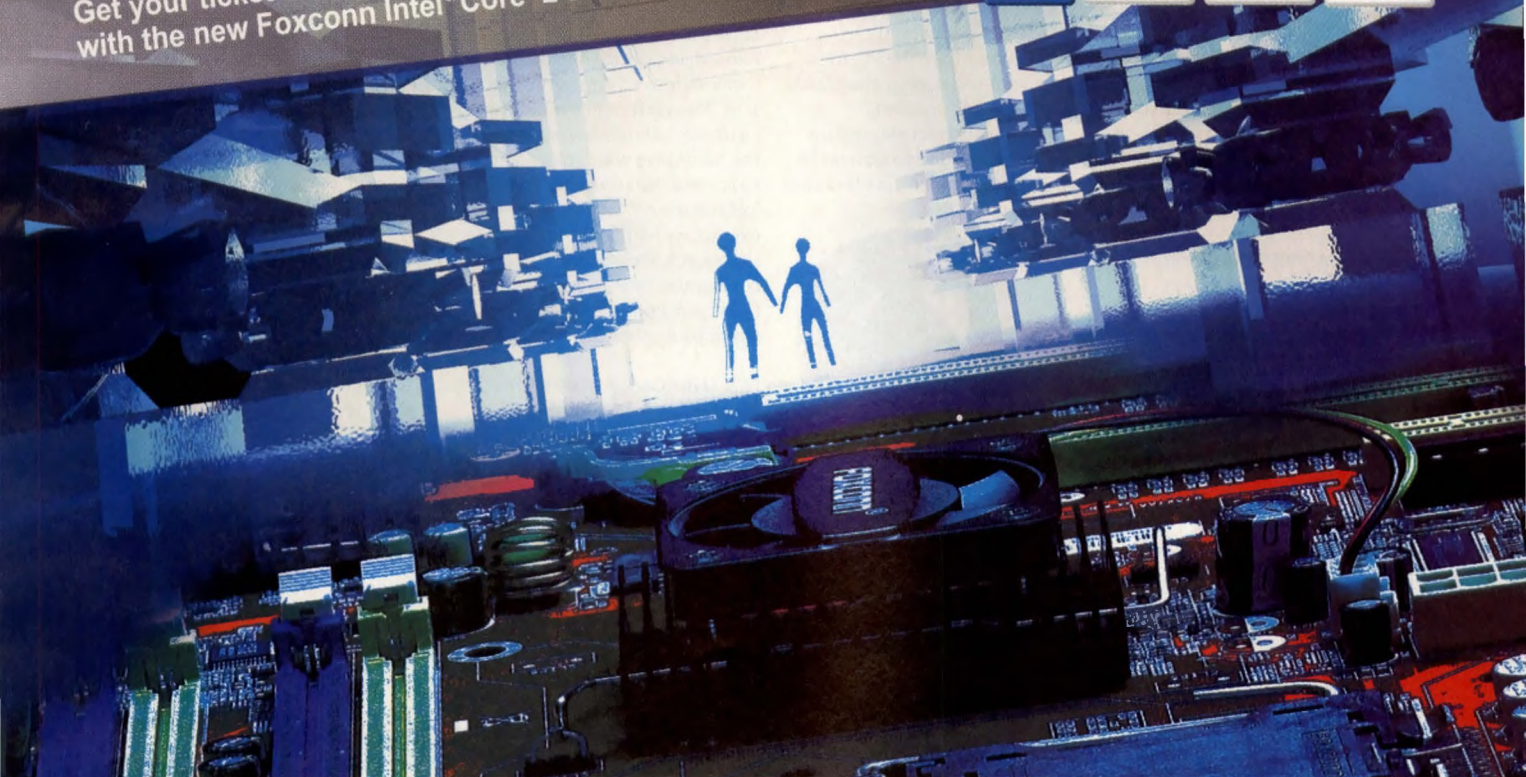
by
Ashton Mills

Editor of the Linux Pocketbooks series, and more recently Atomic magazine, Ashton has been a tech journo for over 12 years, including five years with APC.



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Anger management 101

The problem with some dumb end users is that if they're unhappy, they can get mad. Really mad. Fear is not an uncommon experience among tech support staff.

Readers Paul Gordon from Semaphore, South Australia, recounts how his coolness under pressure got him back to the office in one piece after a support call. "As a PC tech, I often experience stupid customers, as does everyone in this game. This particular day, the customer rang and said, 'The computer's F%^#!D. Can you come over?' I asked what the problem was and the reply came, 'It's just F#\$@!D, I dunno... it won't work and it's making this scraping sound.'"

Immediately assuming the hard drive was the culprit, Gordon asked the customer if he had dropped or bumped the PC. "No, no, it turns on but nothing happens... there's all this writing on the screen, then nothing."

When Gordon could not find a solution, he decided he had no option but to pay the customer a home visit. "Eventually I turned

up at his front door and there he stood. You could see the PC, the front bay panels missing, the plastic face caved in and cracked."

Gordon's first instinct was to turn and run, not wanting to be next to feel the users wrath in case he failed

to fix the machine. But he checked himself and decided to deal with it. "I calmly looked him in the eye and said, 'You hit it didn't you?' The customer calmed down, and when the hard drive was replaced, he conceded the computer had been 'pissing me off.'" Gordon's exemplary handling of this situation is a lesson for all techies confronted by angry customers. Don't run. Look them in the eye and stand your ground.

IT'S THE BOSS, AND HE'S ANGRY

Max Young, from Closeburn, Queensland, was a supervisor on his company's helpdesk when the managing director at a client site was put through to him. This MD would only speak to the supervisor. He complained to Young that some daily management reports had failed to print that morning.

"I calmed the somewhat irate MD and promised to investigate and call him back," Young says. "I dialed through to their system and checked the output print queue. Sure enough, the report was there in the queue with the printer status showing as offline."

"Ah! So someone had unplugged it!" I chuckled, assuming he was angry at someone else, not at me.

"Bad move — the MD screamed back, 'Yes! Your b****y support staff must have unplugged it yesterday!'"

"But we're 200 miles away — they just dialed into your computer to make the change!"

"There was a pause."

"Well, they obviously programmed the computer to unplug the printer!"

"Yep — the MD of a sizable company genuinely believed that his computer could physically remove mains plugs from sockets."

BANG! SORRY ABOUT THAT

Reader Garry Hodson worked for a large government department help desk and recalls a colleague was trying in vain to explain to a lady how to find the reset switch on the front of the PC. "It was on the bottom-left of the front of the PC but she couldn't do it," says Hodson. "I was admiring my colleague's patience, because she was getting to me and I wasn't even talking to her. Finally, he decided to choose a different tack and asked her to reach around the back of the PC and switch the machine off — the on/off switch being located at



"Careful with that plug there..."

EndUser

from
The readers of APC

APC readers who deal with new computer users or incompetent IT administrators share their survival stories.

"Now, about that exploding PC..."



"No ma'am, your home Wi-Fi setup won't extend to 18km away..."

the back on these PCs. There was silence for a moment or two... then a loud BANG! We all heard it even though we were on different calls. She'd reached around and flicked the voltage switch from 240 to 110 volts and completely blew up the PC, smoke, sparks the lot." Ooops.

OH NO, IT'S MOTHER

Matt Richardson from Auckland recently heard the words any young geek dreads. He had just got home one afternoon from school when his mother rushed up to him. Matt recalls: "Instead of saying, 'Hello son, how was your day?', she said, 'Quick, Matt teach me how to use the computer.' Apparently the people at my father's work needed someone to do some simple recording work on the computer. You might be thinking this isn't so difficult, but if you knew my mum you would understand why. Let's just say she's not quite up to date with the technology of today's age. So, after about 2.5 hours, she finally got the hang of Microsoft Word (yay! it's a miracle), and by this time



BAD MOVE – THE MD SCREAMED BACK: "YES! YOUR B****Y SUPPORT STAFF MUST HAVE UNPLUGGED IT YESTERDAY!"

I was starting to get really frustrated going over everything. The next day, when I got home from school, I asked her how the day went. As it turned out, she didn't have to do the recording work because somebody had already done it. This was very annoying, but I also felt relieved — (who knows what would have happened if she'd had to do it?). Well, at least in the end she got stuck with something a little more old fashioned, like filing (LOL)."

WI-FI-TO-THE-MAX

Wireless confuses many end users, it seems. Marco Divitale works on a help desk for a government company in Perth. "I received a call from a staff member questioning me on what sort of range she could expect from her new wireless connection at home. I advised that, set up correctly, she should be able

to use her wireless anywhere within the house and possibly her backyard. The user then proceeded to ask me if it was possible to use her home wireless connection in another suburb — which was 18km away! Holding back my laughter until after the call, I politely advised that, 'No, this is not possible with the equipment in use.' I was then asked what equipment I could recommend so that this could be possible, to which I simply advised, 'A satellite dish!' — this thankfully kept her quiet and off the phone!"

GLORIOUSLY DUMB

We delight in getting stories about really dumb users, and it seems with each issue we find an even dumber one. This tale comes from Christopher French, from Doncaster in Victoria. "I work in head office and provide service to supermarket

stores for certain applications," he says. "A store person called up, stating that they could not download a program from the intranet via the link provided. The program required the user to save it to a drive rather than run it directly from the intranet. I told them to right-click the mouse button on the download link and, when prompted, select 'Save Target As...'. After several attempts from the store person, they stated they were right-clicking the mouse but the prompt didn't appear. Again, I asked are you sure you are clicking the right mouse button, to which they replied 'Oh, I thought you meant am I clicking with my right hand'. On the other end of the line I began banging my hand on my head, thinking 'maybe it's me.' No, Christopher. It wasn't you. Trust us. [BTL](#)

WINNERS!

This month's published readers win a Microsoft Wireless Laser Mouse 6000 worth \$129.95. Made for desktop PCs, it features Microsoft's high-definition laser technology with ultimate precision and smoother tracking and responsiveness (even on unique surfaces). This mouse includes a new magnifier tool and a tilt wheel, making navigating, viewing and editing easier. The Microsoft Wireless Laser Mouse 6000 delivers comfort and superior control to the desktop in a high-end style that will turn heads.



SEND US YOUR CONTRIBUTION AND WIN A PRIZE!

Send in your tales of woe involving dumb end users or incompetent techies to apcenduser@acpmagazines.com.au and if we print it, you'll win a prize. You must supply contact details in order for us to verify your contribution.



Watchdog eyes on vendors

Ticket to ride

Thinking about travel? Make sure to pack the right warranty with that digital camera (in order to keep snap happy).

I was fascinated to read in APC October 2006 (page 27) of a reader's experience following a Sony purchase — and of the response from Sony. In January 2006 we purchased a Sony Cyber-shot digital camera at Heathrow International Airport. In early September, the flash was no longer functioning correctly and so I phoned Sony customer service to follow up regarding service during the warranty period. At this point I was advised that, as the camera had been purchased in the UK, it was not covered by the warranty in Australia, unless we had specifically asked the retailer to stamp the European guarantee to cover Australia. Needless to say, at the time of purchase we were not aware that there are a number of different Sony companies that operate separately — and which don't honour other "Sony" warranties — though we have had fascinating lessons recently on the intricacies.

Sony Australia says that different products are designed differently for different geographic regions (*this is a camera!*) and

that this is why the product is not covered under warranty here (and that other companies apparently have the same policy, which is supposed to be an excuse). Sony UK says that we have to send the camera to a friend/family member in the UK for organising the repair, and that Sony UK will only post it back to an address in the UK. Both of these Sony companies are giving a very clear message that the rule is "buyer beware" — and in the process are creating significant and unnecessary ill will (and bad PR) for themselves.

These archaic and illogical business practices do not make any sense, particularly in this global world and, with a global brand such as Sony, they could not be anticipated by any normal customer. Interestingly, at the company where I took my camera to be repaired (at our own expense), there is a sign stating that "Sony is pursuing world-best practice policies and procedures" in relation to privacy — though obviously not in relation to after-sales service. It stuns me that the different Sony companies

have not established simple accounting procedures to cover reimbursement for warranties (for the other Sony companies) and which do not need for the purchaser of a Sony product to be so blamed for behaviour that could not be known by any ordinary purchaser.

**Miranda Montrone
Glebe, NSW**

Watchdog contacted Sony Australia and invited the company to respond to Miranda's complaint. This is what Sony had to say:

Dear Watchdog,

We were disheartened to hear of your reader's experience with their Sony Cyber-shot digital still camera.

Sony — as a global organisation — recognises that its products are often used to travel (or purchased when overseas). To ensure customer satisfaction after the purchase of these products, Sony offers a tourist warranty card, which makes it possible for products to be serviced under warranty in other countries where Sony operates (for up to 12 months).

Details of the participating Sony countries are listed on the warranty card — and include the UK and Australia. It is issued at the time and location of purchase so it can be tracked and validated accordingly — which, unfortunately, did not happen in this case.

Sony is absolutely committed to providing the best practice policies and procedures, including our commitment to service. We are one of the only electronics companies to offer an international repair facility, via the tourist warranty card.

It is important for customers to request a warranty card at the time of purchase. It should also be offered or suggested by key retail outlets in particularly high-traffic traveller destinations, such as airports.

**Derek Horner
Customer Service Division
Sony Australia**

We got in touch with Miranda to find out what she thought of Sony's response. She remained surprised that the onus lies on Sony customers to request validation of the warranty card (given that many customers, like her, may be unaware of the existence of the card) and stated, "I will personally be very careful before I even consider buying a Sony product in the future."



THESE ARCHAIC AND ILLOGICAL BUSINESS PRACTICES DO NOT MAKE ANY SENSE — PARTICULARLY IN THIS GLOBAL WORLD



MONITORING THE SITUATION

Wayne van Wijk of Brisbane, Queensland, got in touch with Watchdog after experiencing a number of service delays when his 10-month-old 17in Acer monitor "died".

Wayne's retailer instructed him to contact Acer for the warranty claim. After a series of delays and a lack of communication, Wayne eventually received his replacement: a "brand-new" monitor in an "old box from a different model that looked like it had been taped up several times already." This poor specimen "worked for less than one minute before the screen failed". Wayne called Acer and was told that he'd have to wait. Again.

Watchdog contacted Acer to see what the go was with Wayne's monitor

mishaps and was told by a company spokesperson: "The delays in the repair were due to delays in the parts being available. The customer has been contacted as a follow up to this and has received a full refund."

Wayne confirmed this, but told us the company had "missed out a bit of info": "I ended up taking the matter to the Office of Fair Trading, which recommended that I forget trying to deal with Acer and take the matter up directly with the retailer, as the product had not met the standards to which I was led to believe (ie. the lifespan of an LCD monitor should be at least three years). I told the retailer of the Office's advice, which completely changed the attitude of the manager! I was told to come in

immediately for a full refund. So yes, I did get a refund, but with no thanks to Acer, little thanks to the retailer (Officeworks) and lots of thanks to the Office of Fair Trading. Interestingly enough, the same day that I received Watchdog's email saying you were looking into the case, Acer's customer service manager called me to apologise for the problems that I had had. . ."



expect them to go into damage control if they really cared about their product.

Porus Irani
Ringwood, Vic

TomTom made the following response to Porus' grievance:

Dear Watchdog,
Thankyou for bringing this customer's issues to our attention. Firstly, we'd like to apologise for the difficulties this customer has experienced. From our experience (and the positive feedback we have received on the GO 910 to date), this appears to be an isolated incident.

With regard to the reader's 910 device freezing, this can sometimes be a software update issue, so we recommend updating to the latest software for free via TomTom HOME. Failing this, we recommend taking the unit back to the place of purchase to be exchanged for another 910. As stated on our web site, press and

point-of-sale materials (and the product box), the GO 910 comes with maps of Australia only. Maps of other countries can be purchased separately from our web site. Our apologies to the customer for receiving a device with the wrong maps installed.

The Australian maps included with TomTom are Sensis Whereis Navigation maps. Unfortunately, Sensis has not yet mapped all street numbers in Australia and some streets in the Sensis data go across multiple suburbs.

A limited number of windscreen docks included with initial 910 shipments did not perform to our standards. TomTom addresses this issue on our web site: (www.tomtom.com). Any customers experiencing difficulties with their dock can order an optimised windscreen dock free of charge from www.tomtom.com (or through their retailer).

Remo Behdasht
Country Manager
TomTom Australia

WE'RE ON A ROAD TO NOWHERE

I read your recent review of the TomTom GO 910 (APC October 2006, page 44) and bought one. However, I have had the most agonising problems with this unit. The first device froze on me once too often. The replacement did not have the map of Australia on it (it had European and American maps). The third unit had a faulty docking system; every few kilometres I had to readjust the mount angle. The final straw was when the 910 did not recognise

a simple address in Melbourne: I could understand if it was a new suburb, but Box Hill is not a new suburb.

The vendor JB Hi-Fi has been very nice and professional and has returned me my money. I have written to TomTom and they haven't replied to me. After these sorts of incidents, I would



THE FINAL STRAW WAS WHEN THE 910 DID NOT RECOGNISE A SIMPLE ADDRESS IN MELBOURNE: BOX HILL IS NOT A NEW SUBURB!

watchdog@acpmagazines.com.au

Has an IT vendor or telco stuffed you around? Let us know about it and we'll chase them for a solution on your behalf. Letters sent to watchdog@acpmagazines.com.au must include the writer's full name, street address, suburb, state and phone number to be considered for print publication (please also include details such as invoice numbers and people you've spoken to). Address and phone details will not be published. All correspondence becomes the property of APC and is subject to editing.



Epinions have your say!

WALTZING MATILDA

It doesn't matter how you look at it, we are being ripped off big-time by ISPs for our internet access. They ripped us off with dialup and now they're ripping us off again with broadband. The chief architect of this extortion is Telstra BigPond, which pretty much sets the pricing for all other ISPs to follow (and boy, don't they follow). I mean, fair dinkum: \$29.95 for 200MB... what a joke. If we take out of that 200MB all the spam and emails from friends, we'd be lucky if we have 100MB left for surfing. How do ISPs get away with charging users for both sending and receiving email?

If Australia Post adopted the same model they'd be rolling in money. We don't have control over who emails us... so stop billing us. And another thing: if we don't use our monthly allocation we lose it. What's going on there? We pay for something and if we don't use it they take it off us? Bloody robbers: that's what they are. Now I'm going to have a pill and a long lie-down.

Peter Arrighi
Coniston, NSW

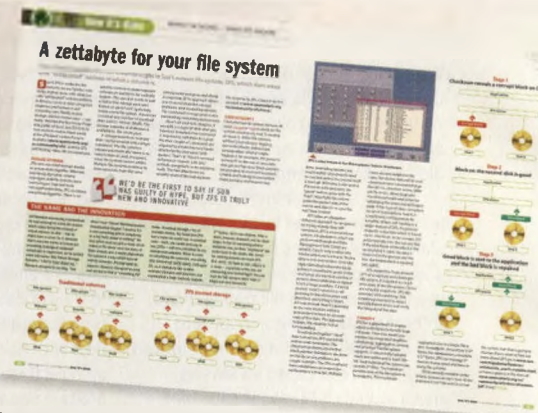
A LEGACY HANDED DOWN

I read "A zettabyte for your file system" (APC November 2006, page 90) with interest, as it looked and sounded much like a much older technology from decades past.

From A to Z: Geoff
from Victoria knows
a thing or two about
the background
of ZFS tech...

Long before most APC readers were born, an operating system was born out of necessity. It was first called "PARS" (Programmed Airline Reservation System) and, through many evolutions, is now called "TPF" (Transaction Processing Facility). This is truly the oldest operating system still in use today. While this sounds like a history lesson about when computer power was rated in "KOPS" (thousands of operations per second), it is necessary to understand that aspects of ZFS were pioneered more than 50 years ago and are now tried and trusted technologies within TPF (and in use by most of the larger airlines and credit card companies, which require very high availability and very high transaction rates). Pooled storage has been around for five decades. It hardly warrants the description "pioneering". Perhaps implementing it in newer operating environments is pioneering, but it is interesting to see the advent of "pioneering" technologies that are merely tried and trusted legacy technology ported to newer platforms.

Geoff Lowry
Doncaster East, Vic



THE SCHOOL FOR SCANDAL

I am fed up with the NSW Department of Education's "DET Portal": a proxy server for schools that control access to the internet. Since the Portal was implemented, internet access has suffered in speed and reliability. Most infuriating is that email services (apart from the DET one) are blocked. No longer can you access Gmail or Hotmail. I believe this is a gross abuse of privacy rights, as the DET can read every email sent by a student (unless encrypted). Also, there is no privacy policy on the site. (Isn't a privacy policy a legal requirement of sites that collect user info?) This wouldn't be so bad if the DET email was good (it's hopeless). Trying to compare the DET email to Gmail/Hotmail is like comparing Firefox 2.0 to IE6. This regulation of email, combined with blocking of blogging sites, email and forums, gives NSW students an insight into what internet use is like in China. At my school, teachers, students and system admins stand united in contempt of this "Portal". It is just

The old five-finger discount:
does broadband pricing amount
to sheer thievery, pure and simple?

●letter of the month

LEAN AND MEAN CLEANING MACHINE

Yet another of those so-called "fix, clean and optimise your PC" programs has hit my desk: Bluesquad Smart PC 3.0. Don't believe the hype because — just like the others — it can cause enormous damage to your computer if you don't know what you're doing.

These programs are just as malicious as some of the viruses out there — they offer to detect problems, fix registry errors, remove junk etc., but what they also do is remove vital

files that are essential to running programs like Microsoft Office.

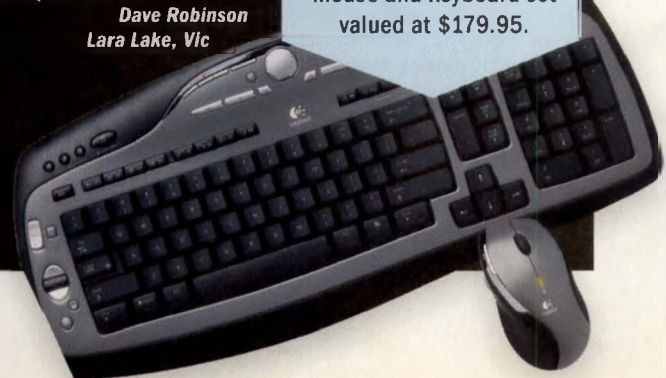
Testing it on an old PC, Bluesquad not only cleaned the junk — it also removed the required files for running MS Word, Excel, PowerPoint (in fact all MS Office programs). Don't think that by setting up a "Restore Point" that this will help you (it won't).

It's about time that these types of programs and their designers got to grips with the problems that are associated with cleaning programs and put in safeguards to protect users from these types of problems. It's no

good putting a disclaimer in supporting documentation — more must be done at the design stage. If we can do this for virus attacks, why can't they do it here?

Dave Robinson
Lara Lake, Vic

Dave wins this
issue's Letter of the
Month prize, a Logitech
MX3000 cordless laser
mouse and keyboard set
valued at \$179.95.



apc

EDITORIAL

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Left of centre: does mainstream tech overlook the needs of a significant proportion of the user community?

something the DET introduced so they can tell everyone that they are "providing secure internet and email" to students: a disgusting publicity stunt — and I know that students reading your magazine echo my dissatisfaction.

Daniel Bergamin
Quakers Hill, NSW

NAME YOUR PRICE

Lenses for my Nikon camera are regularly 15-30% above what they retail for in the US. It seems that, while it is not palatable, we have

difference. Yes, I am aware we can purchase on eBay and other sites, but this can bring its own set of problems should anything go wrong. Also, I like to support local retailers. Are we being suckered? Is there a reason for this of which I am not aware?

Chris Mills
Elimbah, Qld

FRIES WITH THAT

Contact any large manufacturers and try to buy a computer without a preloaded version of MS and, since you're not going to use Windows, just try getting a refund for the additional software they throw in (such as Encarta et al.). The average Joe goes to Harvey Norman or Dick Smith to buy a PC, and they don't know how to build their own. Logic says the average Joe is going to have to pay for MS software regardless. The regulators haven't gone far enough to protect the multitudes of hapless innocents that don't have the tech know-how. What they should be doing is

Steve Berrick
Mount Lawley, WA

THE PRINCE AND THE PAUPER

Reading through the Watchdog and Epinions sections I am often



I BELIEVE THIS IS A GROSS ABUSE OF PRIVACY RIGHTS — AN INSIGHT INTO WHAT INTERNET USE IS LIKE IN CHINA

come to expect it. However, sometimes we have to stop and ask, "Isn't this a little over the top?". I have been a loyal HP user for around 10 years. When the announcement was made regarding the new B9180 printer, I started to look at this as a future purchase. Imagine my amazement when I saw that purchases as low as US\$570 were available to our US compatriots, while we appear to be paying AU\$1,499. Thinking there may be an error, I went to the US HP site and checked the RRP. It was US\$699. At current exchange rates this is less than AU\$950. I can't understand why there is an extra \$550 on the price. This is a huge

forcing PC manufacturers to price their goods including (and excluding) MS additions so that we, the consumer, can have a real choice. I have bought over a dozen PCs from Compaq and Dell in the last two years — and not one of them came without the option for Microsoft. Even when requested, they still couldn't cater to my needs. Ironically, I get it home and install Debian Linux.

Chris Milner
Mawson, ACT

LEFT TO OUR OWN DEVICES

A couple of months ago I purchased an O2 Atom and discovered the

astounded to read about the lack of support for products by the major manufacturers. I think it is horrible that companies try so hard to get you to buy their products, but once you've bought it — bye bye. There are thousands of blogs, chat rooms and forums that have been created to cover for the shortcomings of the big corporations. Think of the man-hours that have been put in — just because of a lack of support from the big vendors. They treat you like kings until they have the money — then you return to being a lowly peasant scrambling for support.

Bryce Roney
Cessnock, NSW

epinions@acpmagazines.com.au

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This month in Labs. . .

Bleeding-edge paper cuts

You may have noticed that we're covering Vista pretty heavily this month — we've put together all of the guides that you'll need to get it installed and up and running (and well) on your system, no matter how old your setup is. However, there's one big piece of advice that goes for computing in general (not to mention in many other complex systems). A computer is only as fast as its slowest component. So when you're looking at upgrading, don't skimp on something to go overboard on another. You might have the fastest CPU on the block, but if you've only got 512MB RAM in your machine, it will still run like a dog. Also, remember that every

new product we see suffers from Version 1.0 syndrome X — so don't be too surprised if a bug or another "undocumented feature" jumps up and bites you. (But fingers crossed.)

I find it interesting that Microsoft has delayed the end user versions of Vista until now. The business versions of Vista were released in November, but only later this month can the average Joe grab a version at their PC shop.

The biggest visible difference between Vista and its predecessors is the Aero interface. But that's not the entirety of the changes, and, in the grand scheme of things, it's one of the smallest benefits of moving to Vista as a full-time OS. What it does though is raise the

barrier of entry for those who in the past have shunned 3D graphics cards. Here at APC we're all about the latest in 3D technology, and we see it as a good thing. Not Aero itself, necessarily, as it's a sucker for resources, but the near forced switch to 3D-capable hardware in most desktop computers.

One of the constants since Windows took over the desktop has been the user interface. Minimise, maximise and close have been hovering on the top-right hand of every screen since day one, and it's all been All-Bran plain. Hopefully, and I can't encourage this more, we'll see some changes in the way applications are presented on screen and the way we interact

with them — enabled by 3D hardware. Once it's a base part of a computer's spec, people will start to use it. If I put on my special goggles to peer into the future, I can see 3D graphics as another step in the process that saw us go from monochrome to EGA to VGA to high resolutions (like the over-the-top abbreviation WSXGA) and beyond. **APC**



HOPEFULLY WE'LL SEE CHANGES IN HOW APPLICATIONS ARE PRESENTED — AND IN THE WAY WE INTERACT WITH THEM

NICK RACE — TECHNICAL EDITOR





FIRST LOOK

Microsoft Zune

It's been slammed overseas — is the Zune really the iPod-killer?

So, how does a company go about toppling the Big Apple? Past experience has shown that extra features alone don't constitute an iPod-killer; so, while the Zune has music, photo and video playback, as well as an FM radio, customisable wallpaper and themes, it's nothing the market hasn't been seen before.

Microsoft's secret weapon, which isn't available in Australia just yet, lies in the Zune's built-in 802.11g WLAN, a feature that lets users embrace a more "social" aspect of mobile entertainment by wirelessly sharing music and photos between devices. Pictures can be shared without limitation; however, any music files sent from another Zune expire after three days or three plays (whichever comes first), at which point you have the option of buying the song from the online Zune Marketplace. This makes sense for commercial music, but unfortunately the restriction applies to all audio files.

File formats compatible with the Zune are fairly limited. MP3, WMA and unprotected AAC tracks are supported on the music side, but only JPG pictures. Natively, only WMV movies can be played,

CONTACT	Microsoft
PHONE	N/A
ONLINE	www.microsoft.com
MARKET	Everyone
PRICE	US\$249

although the desktop software automatically transcodes popular formats like DivX and MPEG-2 to WMV — albeit very slowly and with a degradation in quality. Wide-screen movies are also zoomed in to remove the black bars, which wreaks havoc with the video's aspect ratio — something we couldn't change in the software.

We were pleasantly surprised by the sound quality, which produced a clearer, fuller sound than the latest 80GB iPod. Seven equaliser presets adjust acoustic levels quite well, but you can't create a custom EQ.

Available in black, brown and white (all 30GB capacity), the Zune's external aluminium case has a different colour to the internal case, resulting in blue, green and white glows around the player's edges. It also has a matte finish immune to fingerprints and scratches.

Size-wise, it's longer, thicker and heavier than the 80GB iPod. Then

✓ Large screen; user-friendly interface; excellent sound quality.

VERDICT ★★★★★

✗ Limited file format support; half-baked desktop software.

again, it also has a larger 3in screen, which makes a huge difference when viewing movies and pictures, where the screen orientation is automatically rotated to landscape.

Combined with an intuitive interface, this makes the Zune a pleasure to use. The circular navigation pad looks similar to the iPod's click wheel, but it's actually a four-way controller that works extremely well with the Zune's menu system. With Wi-Fi turned off, Microsoft claims up to 14 hours' worth of battery life for music and four hours for video, which is directly comparable to the 30GB iPod's battery estimates. Our music run-down test, which plays a music library consisting of 128KB/s and 192KB/s tracks with the screen turned off, achieved a score just shy of this at 13 hours.

Surprisingly, the Zune isn't compatible with Windows Media Player; nor does it support secure

WMA music purchased through online music stores like BigPond and ninemsn. Instead, Microsoft has created a completely new desktop media program named, appropriately enough, Zune, which ties into the online Zune Marketplace for buying music. It's not supported in Australia yet, so think carefully before importing a Zune from the States.

We found the software to be buggy and bloated, particularly during the installation routine, which hung at 95% in our first attempt on two PCs. Completing installation also requires inputting a lot of personal information, as well as setting up a Windows Live account and a Zune tag — identical to an Xbox gamer tag. While the Zune software bears a passing resemblance to Windows Media Player 11, it's far from easy to use.

This frustrating user experience on the desktop and limited file format support are the Zune's greatest weaknesses, and while the wireless sharing feature has a lot of potential, it relies on a large community of users to be truly useful. As a first-gen Microsoft product, the Zune isn't a bad attempt. As it currently stands, however, it's not a compelling enough package to take on the big Kahuna.

Jenneth Orantia



MICROSOFT'S SECRET WEAPON LIES IN THE ZUNE'S BUILT-IN 802.11G WLAN, FOR WIRELESS SHARING OF MUSIC AND PHOTOS

Motion Computing LE1600

Full computing power plus the convenience of mobility.

Motion Computing is one of the bigger names in tablet PCs, and it's not hard to see why. The new, lower-cost LE1600 Tablet PC is full-sized and "full powered" for productivity on the move.

This model differs from the LS800 reviewed last year in *APC* (September 2006, page 52) in both size and spec. The LE1600 is a 12.1in model and the system's internals have also been updated.

The LE1600 is based on an Intel Pentium M Low-Voltage model running at 1.5GHz with 2MB cache. It's also available with a Celeron SKU. It runs off the Intel 915GMS chipset, including graphics, and runs Microsoft Windows XP Tablet PC Edition. The base model

includes 512MB of DDR2 and can support up to 1.5GB of RAM. For storage, the device runs a 1.8in (iPod-size) hard disk drive in either 30GB or 60GB; obviously there's no built-in DVD or optical drive. It uses Intel's Pro/Wireless 2200b/g and there's built-in Gigabit Ethernet and Bluetooth. As with most tablets, there's an RFID pen for interaction with the screen surface. There's no touchscreen, but the LE1600TS model includes this functionality. All of this fits in a 1.4kg package.

Connections are important on a tablet, and the LE1600 has enough to get by. There are two USB ports, CardBus and a custom DVI-D connector, as well as an interface for accessories like keyboards and



desk stands. For business security, the device includes a fingerprint reader and a TPM. A centralised security control panel helps tie it together with the Softex OmniPass security software.

On the bench, the unit scored a PCMark05 of 1,511, ample for business and field-related tasks as expected of a Tablet. The battery life with the standard pack was one hour, 57 minutes. There is an extended-life battery available for \$516 if required. Accessories are available from Motion, including a

convertible keyboard for \$378 and a docking station for \$549.

All in all, the Motion LE1600 isn't a device that will convince anyone that tablet computing is what they need. However, it's solid, has enough performance for nearly all usage models and is a serious contender in situations where

CONTACT	Motion Computing
PHONE	N/A
ONLINE	http://motioncomputing.com.au
MARKET	SMB / Enterprise
PRICE	\$4,311

✓	Good security; nice screen.
☆☆☆☆	VERDICT
✗	Weak standard battery; no ExpressCard for mobile broadband.

Vastute AO-Mini Executive PC

Save your desk space with this simple and budget-conscious PC.

During the Mac mini release, analysts everywhere proclaimed the death of the ATX tower case and the new coming of the tiny PC. Over a year later, the x86 world (and the vast majority of PCs sold) have proved the analysts to be definitively wrong. Businesses still demand desktop cases for ease of maintenance and home users have passed on the small, hard-to-upgrade and inflexible design of ultra-tiny cases.

CONTACT	Vastute
PHONE	(02) 9633 3344
ONLINE	www.vastute.com
MARKET	Everyone
PRICE	\$745

However, they do have their uses, and Vastute — a vendor new to *APC*'s pages — has hit the nail on the head with their solution. There's a huge demand for low-price, CE-type computing devices, ideal for students and small

✓ Small, capable and cheap.

☆☆☆☆ VERDICT

✗ Really needs more USB; Linspire isn't for everyone.

business where power is secondary to price. Vastute's take on the low-cost PC is one of the neater solutions we've seen that makes use of the ultra-small PC system design (which hasn't been a success in the enthusiast — or pretty much any other — market).

Vastute's AO-Mini PC uses the AOpen MP915-X "cube" platform, a fully fledged Intel 915GM system designed for Intel Mobile processors. The tiny 165 x 50 x 165mm (WxHxD) unit packs a decent amount of firepower considering its size. The system Vastute sent to *APC* was an Intel Celeron Mobile 1.6GHz model, with 512MB of RAM and a 40GB 1.8in hard disk drive. The unit has been upgraded to contain an

802.11a/b/g wireless adaptor. There's two rear USB ports, both of which will be populated with a keyboard/mouse combination (included by Vastute), so expect to spend a little on a USB hub if you wish to connect any other devices. The output from the Intel graphics is via DVI, but an adaptor is included.

To save further expense, Vastute provide the unit with Linspire and a subscription to the Linspire software repository at the included price, but there's nothing stopping you from paying extra for a Windows licence.

Now, the Vastute AO-Mini PC is far from a powerhouse, but the system is more than capable of office productivity tasks, internet browsing and basic multimedia. If you're very conscious of cost (or space), then it would be harder to find a commercial, supported product at these prices.

Nick Race



HP Photosmart A716 Photo Printer

Small and super portable, but just not quite there.

HP's small photo printers have been a highly recommended staple in the market for quite some time now. Since the launch of its first Toaster printer, HP's been making all the right moves for those who want a straightforward solution for printing photos at home.

The Photosmart A716 is a successor to these models, but it doesn't really add up on the bench. The specs are all there, a 1,200dpi ink-based printer that supports paper sized up to 13 x 18cm (or 10 x 30cm panoramic). It has a built-in battery and carry handle, and 96MB of memory to support larger prints, plus 4GB internal storage.

It's strange. The A716 we received was bundled with a sampler of 13 x 18cm photo paper, — a bizarre size to print. Some may prefer the bigger area to work with, but don't expect them to fit into some frames or albums. Of course, the bigger paper means chewing

through more ink and a price premium to boot.

Working with images from a PC, a memory card and a memory stick (it also supports PictBridge cameras and USB optical drives), the device identifies and displays photos with relative ease. Navigating between the photos, or cropping, resizing or zooming, is a painfully slow process. Though it's designed to be used independently of a PC, actually editing, cropping and selecting a day's photos (let's say 24, using the old roll metric) would take a considerable amount of time.

The photo printer also comes with a remote control, theoretically so you can plug the printer in to your TV and operate it from there,

but one wonders how often this scenario is enacted.

Photo prints, though not bad by any stretch, were skewed toward greens and yellows and a tad oversaturated, but skin tones looked great. It's reasonably fast as well — six test prints came out in under 10 minutes. All in all, it achieves its goals of printing photos in a portable and PC-independent manner, but if that's not what you really need, consider simpler (and cheaper) alternatives.

Nick Race

CONTACT	HP
PHONE	1300 304 889
ONLINE	www.hp.com.au
MARKET	Everyone
PRICE	\$499

✓ The do-everything, go-anywhere photo printer.

VERDICT ★★★★★

✗ You're paying a premium for functionality most won't use.



Samsung CLP-300

Samsung's new personal colour laser is the smallest of them all.

The new CLP-300 colour laser is small — really small. Though there's added height over an everyday ink-based printer (it's 265mm tall), the footprint is comparable to ink printers with a built-in paper tray, measuring in at 390 x 344mm (WD).

The R&D department at Samsung has also done away with much of the complexity of using a laser printer, designing a barrel-based toner system that, I dare say, is even easier to use than most ink cartridges. It's keyed so it can't be installed incorrectly and Samsung's software package gives

you big, bright animations for every process where you need to open the lid, like in a paper jam. The printer runs under Windows and Linux (there's no OS X support).

Consumables are reasonably priced: there's CMY colours good for 1,000 pages for \$80 each; the black toner runs for 2,000 pages for \$90; the imaging unit lasts for 12,500 pages and can be replaced for \$273; and a waste toner box that needs replacing every 5,000 pages at a cost of \$18.

The CLP-300 is advertised with a 4ppm colour print speed and a 16ppm black and white. It uses the computer's GDI system, so your speed will vary. We tested the printer with a new document, with loads of graphics, tables and logos

to see how long it took to print. The 24-page document printed in high quality colour in eight minutes, 34 seconds. In black and white, the same 24-page document was completed in almost a quarter of the time, at two minutes, 24 seconds. Let's see your ink-based printer do that!

Our only complaint about this little wonder is the quality of colour images — though I wouldn't regard it as bad (nor comparable to high-end colour lasers), there's a little banding and the colours are muted. That said, it's certainly capable enough for school or business documents, and a far sight better than many cheap printers on the market.

Nick Race

CONTACT	Samsung
PHONE	1300 369 600
ONLINE	www.samsung.com.au
MARKET	Everyone
PRICE	\$499

✓ Small footprint; user-centric design.

VERDICT ★★★★★

✗ Image quality could be better.



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D-Link DPH-C160S DECT VoIP Phone

VoIP economy meets DECT range and voice quality.

The DPH160S has that slightly retro Euro-styling common to most DECT (cordless) phones. It has a quality feel, though the handset gets noticeably warm from charging the three AAA NiMH cells.

The unit works with one PSTN and one VoIP line, with call-waiting between them. They're selected with different buttons when placing calls, and consequently there's no automatic failover to PSTN if the net connection is broken.

Voice quality and volume were both good and the speakerphone function worked well. The range covers most of a normal suburban block without losing quality.

The review sample was preset to a GoTalk account, so setup merely involved connecting the network, power and phone cables. The device does have a web interface for configuration, including the option of labelling packets using ToS (Type of Service) or diffserv for

prioritisation by a router supporting QoS (Quality of Service). The DPH-160S can be programmed with the IP addresses of up to 10 IP phones for peer-to-peer use.

Having a separate contact list and phonebook seems awkward. The ten-number contact list is accessible via a one-button menu or speed dialling; the 200-number phonebook is edited from the handset, requiring multiple keystrokes. We would prefer a single list managed via the web interface. A more detailed manual would be welcome too.

Three-way calls using the VoIP and PSTN lines requires support from the VoIP service provider until

new firmware is released, probably early 2007. Also to come is support for multiple handsets, including intercom functionality. The base has provision for an extra pair of RJ-45 sockets, suggesting there may be a model with a built-in switch to allow other devices to piggyback on the same network connection.

However, the DPH-C160S is much more expensive than an ATA plus a DECT phone.

Stephen Withers

CONTACT	D-Link
PHONE	1300 700 100
ONLINE	www.dlink.com.au
MARKET	Everyone
PRICE	\$269.95

✓ Stylish and effective; good audio quality.

VERDICT ★★★★★

✗ On the pricey side.



Netcomm NP290W

Your Wi-Fi may not reach every corner of your pad, but your electrical wiring does.

The sales pitch for these HomePlug adaptors is appealing: you plug in the non-wireless adaptor to a power point and attach it to your existing router via Ethernet. You then plug in the wireless adaptor to a power point elsewhere and — alakazam! — the two adaptors make an Ethernet link over the power lines (at "up to 85Mbit/s") and you have wireless coverage at the far end.

Our real-life testing provided more varied results. In a small apartment, the best result we could get using iPerf to test

throughput was 17.6Mbit/s, and generally speeds were around 6 to 14Mbit/s depending on the powerpoint we tested on.

Those speeds are not fast enough for streaming high-def video, but another APC staffer who tested at his house was able to get up to 60Mbit/s, which shows that the home wiring and noise from other attached appliances can make all the difference.

The other caveat is that the two adaptors can

only be used on a single "phase" in your house. A phase is the circuit attached to a single fuse in your fuse box at the front of the house. In most houses, power points are on a single shared phase, but in larger houses, or upstairs and downstairs, may be on separate phases, which will prevent the HomePlugs from connecting.

The upcoming HomePlug AV standard is supposed to solve this by bridging phases, using a much broader range of RF frequencies.

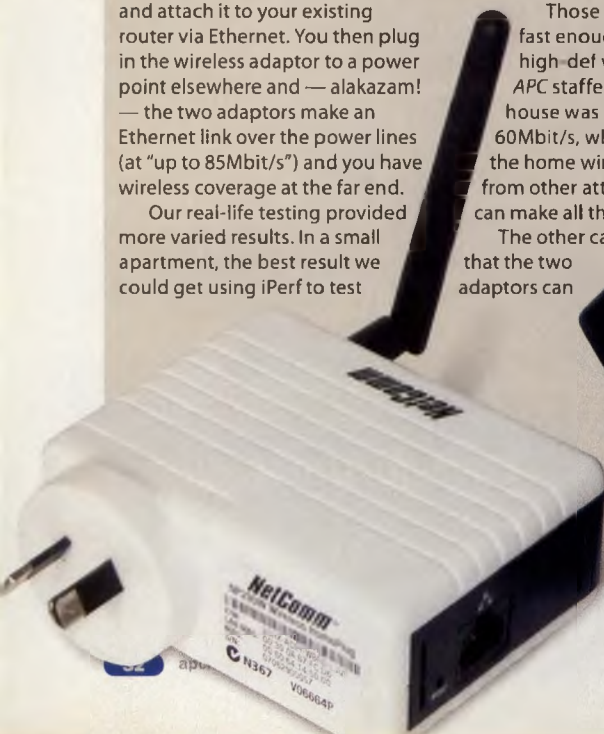
However, these adaptors are based on the earlier HomePlug 1.0 Turbo standard.

The \$199 price is more costly than buying a

higher gain antenna for your existing modem/router, but easier to set up due to the number of different types of antenna connector. As, you can't easily test speed or phase compatibility before you buy, establish your return options with your retailer.

A common misconception about HomePlug is that your neighbours will be able to jack into your home Ethernet. This isn't quite true: DES-56 encryption is used on your power wiring and the wireless end supports WEP. A Windows-only utility is supplied to configure these (the adaptors come paired with powerline security, but no way of configuring Wi-Fi security for Mac or Linux users).

Dan Warne



CONTACT	Netcomm
PHONE	(02) 9424 2000
ONLINE	www.netcomm.com.au
MARKET	Everyone
PRICE	\$199

✓ Go where no Wi-Fi has gone before.

VERDICT ★★★★★

✗ Expensive; highly variable speeds.

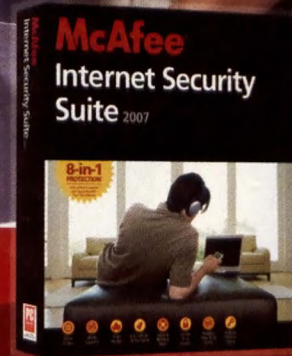


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LG LST-5403P digital video recorder

All the fuss is about digital TV, but it's PVRs that are the way we watch.

This LG unit is a high-definition digital set-top box with a built-in 250GB hard drive recorder which holds up to 40 hours of HD or 80 hours of SD recordings (the 5402P offers 160GB). Thanks to dual HD tuners, it lets you record two programs at once while watching a third live broadcast or watching something you've previously recorded. You can also watch the start of a movie while still recording the end. Thankfully, an excellent On-Screen Display system avoids confusion. If you press stop while playing and recording, it asks "which one do you want to stop: playing or recording?", an invaluable feature.

You can also pause a live TV broadcast and even perform an instant replay of live TV at any time, because it automatically keeps a buffer of whatever you've been watching (up to two hours from whenever you last changed the

channel). Disappointingly, the "smart skip" button, presumably for skipping ads, is not very accurate.

While it all sounds complicated, the LST-5403P is very simple to use and has big, onscreen menus and an enormous, well-laid-out remote.

The electronic program guide only reveals what's on now and next; frustrating if the networks

ever did bother to embed a seven-day EPG in their broadcast signals. You can manually schedule recordings but can't perform one-touch recording from the EPG.

A look at the back of the LST-5403P reveals all the usual suspects: RF, composite, component and S-Video as well as RGB and HDMI outputs. It also has digital (coax and

optical) and two-channel analogue audio outputs. The LST-5403P's main shortcoming is the amount of noise it makes. At all times there's a background hiss as if you've left your amplifier switched on. You can also hear the hard drive ticking when you record or fast-forward.

Apart from the lack of a seven-day EPG, the LST-5403P gets a tick in every box and would be an excellent addition to any lounge room — as long as you have a reasonably soundproof AV cabinet to hide it in.

Adam Turner

• **CONTACT** LG
• **PHONE** 1800 725 375
• **ONLINE** www.lge.com.au
• **MARKET** Everyone
• **PRICE** \$1,499

✓ Large capacity; HD; great features.

• **VERDICT** ★★★★★

✗ No seven-day EPG.



SnaZio SZ1350 Net DVD Cinema HD

This network-enabled MPEG-4 DVD player lets you enjoy cinema from the couch.

Thanks to on-board Ethernet and 802.11g wireless you can play files stored on any Windows or Mac computer on your network, but you must install software first (you can email the manufacturer for a Linux version).

A PAL/NTSC progressive-scan DVD player, the SnaZio handles CD, VCD, SVCD, MPEG-1/2/4 (including DivX and Xvid), MOV, Nero Digital and Windows Media Video 9 files — burned to CD or DVD, or from a USB device. It can play HD video, outputting up to 1080i, but not Blu-ray or HD-DVD discs. It plays MP3, AC3, WMA and OGG Vorbis music files as well as several image formats. Outputs include

• **CONTACT** Micronica
• **PHONE** (03) 9699 8844
• **ONLINE** www.micronica.com.au
• **MARKET** Everyone
• **PRICE** \$544

✓ Wired/wireless; plays internet radio, TV and podcasts.

• **VERDICT** ★★★★★

✗ Requires software; can't directly access non-SnaZio NAS

composite, component and S-Video along with SCART and DVI-D. Audio outputs include stereo and 5.1 analog along with coaxial and optical digital.

Disappointingly, the SnaZio can only play directly from a network drive if it's a SnaZio Tera NAS. You can get around this by pointing the software on your computer to your third party NAS, but this defeats the purpose. Installing the software gives the player access to

some useful net features, such as bookmarks and the ability to play podcasts straight from the web.

Other advanced internet features like web browsing and net TV and radio help the SnaZio stand out from the competition. Disappointingly, the browser is clumsy and shows sites poorly.

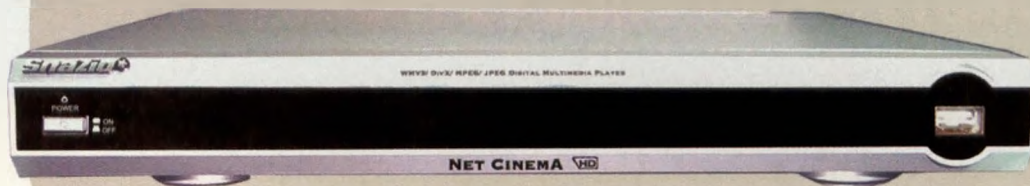
SnaZio has attempted to compensate for the dearth of online content by creating a SnaZioZone content portal, but it's

also clumsy and offers no local content. SnaZioZone lists internet radio and TV sources, but few of the latter actually worked. One that did, SwissTeleM1, was pixilated and jerky but this isn't the SnaZio's fault (as it's not supposed to be broadcast-standard).

Lack of decent content is SnaZio's greatest challenge and this is how the media moguls want it to stay until they're ready to dominate multimedia on the web. The obliging Federal Government is helping by considering forcing internet television providers to apply for a broadcasting licence, so it can regulate web TV out of existence — just like it did to datacasting.

Meanwhile, the SnaZio SZ1350 is a decent media player, but it's hampered by a sluggish interface, poor instructions and ambitious internet access features which fail to meet expectations.

Adam Turner



ASUS recommends Windows® XP Professional



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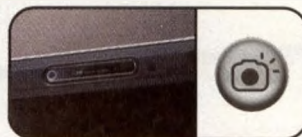
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KBackup 0.5.1

A simple backup program for those still finding their way around Linux.

Linus Torvalds' favourite K Desktop Environment (KDE) comes with a plethora of tools, utilities, games and applications. Some people find it a tad overwhelming, but there is no use denying that, for new and inexperienced Linux users, these programs are very helpful. Moreover the applications that come with KDE often have thought-out, bright and friendly user interfaces and don't require extensive Linux prowess and experience. Most of them can be picked up very quickly and used with just a modicum of Linux knowledge. There is often a downside too. These programs are not always feature-rich or as

powerful as their hardcore console-based brethren. Nevertheless, they do provide a good stepping stone for learning Linux.

KBackup is an application which falls into this basket. You may have already guessed that it is a system for backing up files and directories. KBackup is not hard to use. The user is presented with a tree view of the file system on the left hand side of the main window. Each file and directory in the tree view has a check box next to it. The user needs to check the required boxes and click on the Start Backup button to create an archive. For posterity, the user may save a profile with their selections. Multiple profiles are possible.

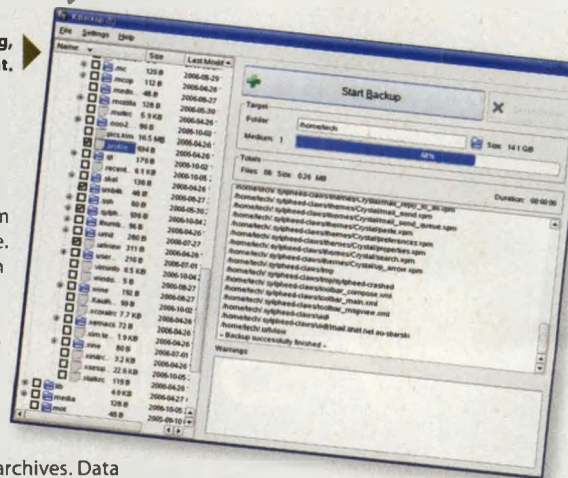
The interface is big, bright and brilliant.

If several profiles are used, developers recommend loading them from the command line. It's just faster than manually clicking through, but again, you can use the GUI if you are not comfortable with the CLI.

KBackup stores data in tar archives. Data can be stored in a single slice or in multiple slices. Each slice features the creation date and time and a trailing part number if more than one slice is used. KBackup is also supposed to compress tar archives with bzip2 or gzip but, strangely, on our test bed it didn't. The only other

issue is that if you have to restore files you must do it manually, e.g. tar -xvf etc. It's not hard, but we would have preferred a GUI-based control as well. Otherwise, KBackup is a fine KDE utility which is worth a look.

Peter Sbarski



CONTACT Martin Koller
PHONE N/A
ONLINE www.kde-apps.org
MARKET Everyone
PRICE Free

Easy to make backups; profiles.
VERDICT ★★★★★
User must restore files manually.

Tea 14.1.0

A modest but versatile text editor that's just about ready for prime time.

This GTK2-based text editor includes source code from lots of different projects such as Bluefish, Gaim, Gedit and Anjuta. It seems that Tea's author has done a reasonably good job refactoring and integrating elements of these programs together. Tea comes across as a thought-out, feature-rich and consistent application.

Some notable features in Tea include markup support for HTML, XHTML and LaTeX. However, we wish it indicated which markup mode is currently selected.

Tea can be used as an Integrated Development Environment (IDE) for small programming projects. Its syntax highlighting is very good. Another nice feature is base conversion: Tea converts binaries and hexadecimals to decimal.

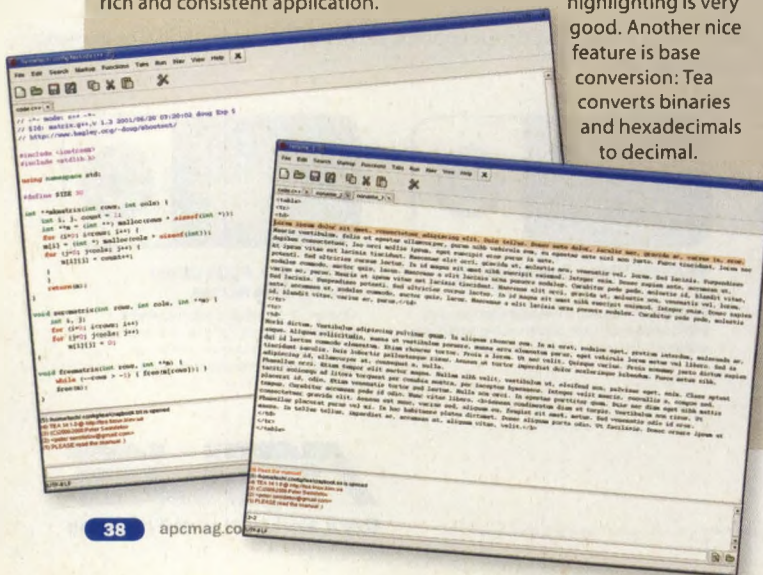
When it comes to string manipulation, Tea really excels. You can escape and quote, unescape and unquote, reverse, kill formatting, filter, remove blank lines and shuffle, search, convert tabs to spaces and vice versa, change double quotes to facing quotes and more. All of that is possible in vi too, but if you are not familiar with vi, you will find Tea easier to use.

Tea can serve as a normal text editor too. It can read OpenDocument, RTF, Kword, AbiWord and OpenOffice.org Writer documents. Unfortunately, it can only save as plain text (but it can check spelling). It must be said that Tea's OpenDocument support is pretty iffy. The first time

we tried to open a document, Tea crashed due to a segmentation fault. The second time it worked better, but some of the formatting information was lost.

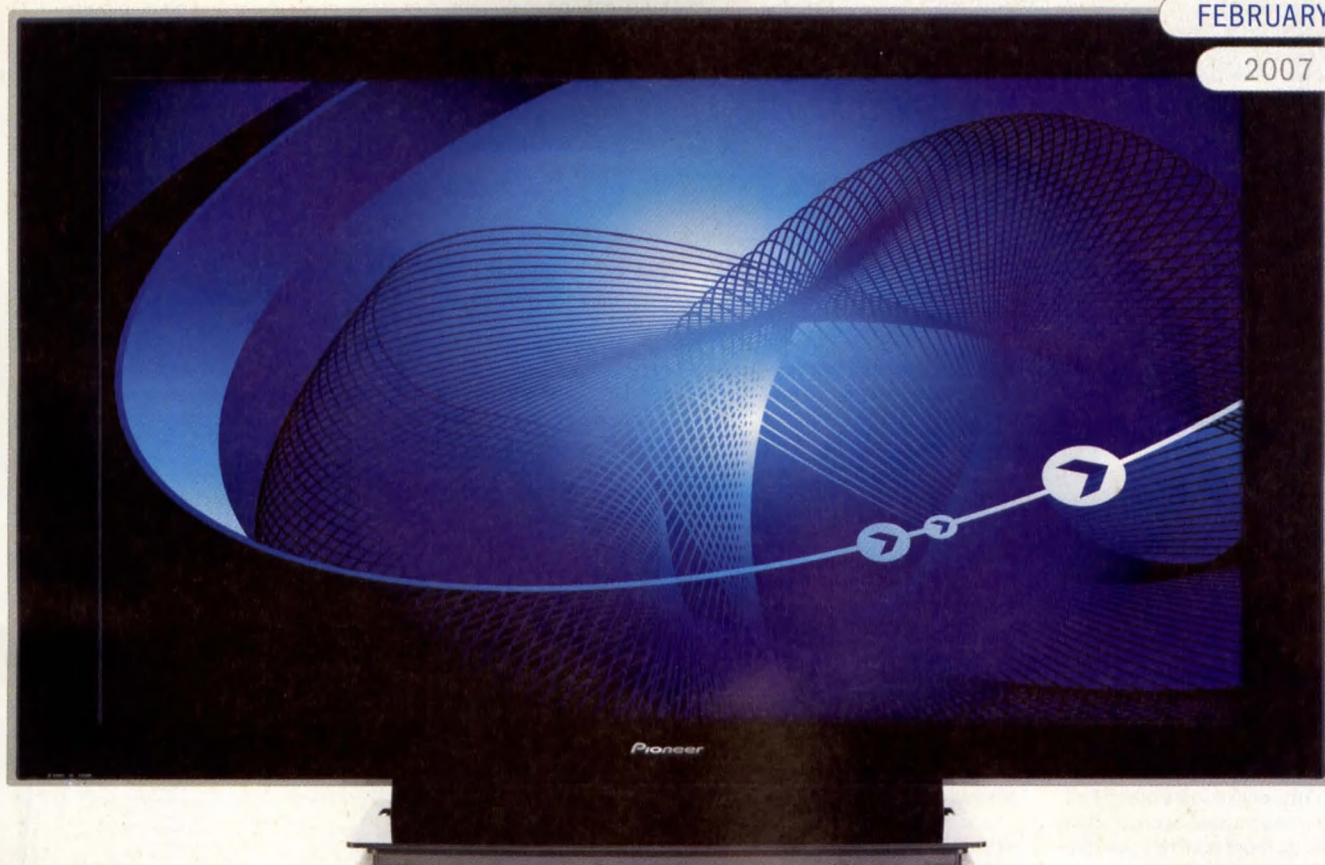
In terms of stability, Tea wasn't exemplary. It crashed at least a few times even when we weren't really doing anything. We guess that the author still needs to do a tad more refactoring and a bit more debugging. Check out the remaining features, which include tabs, templates, drag-and-drop support, subtitle editing, bookmarks, customisable hotkeys, multiple encodings (and much much more) on Tea's web site. If Tea continues to improve, one day it may become your cup of coffee.

Peter Sbarski



CONTACT Peter Semileto
PHONE N/A
ONLINE http://tea-editor.sourceforge.net
MARKET Everyone
PRICE Free

Enormous amount of features; small size.
VERDICT ★★★★★
Poor stability.



Pioneer PDP-5000EX 1,080p

For home theatre with limitless funds, giant plasma is the ultimate extravagance.

If your lounge room is crying out for a truly mammoth screen, you should look to the plasma giants. Pioneer's behemoth 50in (125cm) PDP-5000EX is one of the first plasmas offering 1,920 x 1,080p resolution, the highest definition available and perfect for watching Blu-ray, HD-DVD or HDTV.

The PDP-5000EX isn't actually a television, so you won't find it in our Best Tech HDTV awards. There's no TV tuner or speakers, but it does have speaker terminals. The rear also sports DVI, component, composite, S-Video and two HDMI inputs, plus stereo audio inputs for each video source.

Fifty inches might sound too big for your average lounge room, but the PDP-5000EX's thin black bezel

CONTACT	Pioneer
PHONE	1800 988 268
ONLINE	www.pioneer.com.au
MARKET	Everyone
PRICE	\$14,999

and clean lines mean it doesn't dominate the room. Feed it a high-definition signal and the PDP-5000EX screams for your attention.

The picture is spectacular — razor-sharp with fluid motion, vivid colours and deep blacks. There's none of the contrast, blur or viewing angle problems you can get with LCD. It's no exaggeration to say that, right now, the PDP-5000EX offers the best picture money can buy.

While big is beautiful, there's more to a display than just inches and pixels. Giant televisions help

✓ Immaculate, high-res display.

VERDICT ★★★★★

✗ Expensive; no speaker or tuner.

high-definition look its best, but they also magnify any imperfections the picture may have, so standard-definition material often looks quite terrible.

This is not the case with the PDP-5000EX, thanks to the excellent onboard video processing, which ensures that DVD, VCR and normal television still look their best.

Pioneer also ensures the PDP-5000EX looks great by offering not just free delivery but free calibration, sending out a technician to adjust the display to suit your

lighting conditions and your existing AV components — even if they're non-Pioneer gear. These settings can be stored in the display, which can be a godsend for those who can't help but tinker with every setting.

The fact that both high- and standard-definition images look spectacular on the PDP-5000EX makes it the perfect display to ride out the slow introduction of high-definition content. The only drawback is the hefty price tag — especially considering you still need speakers and an external tuner — but the PDP-5000EX aims to offer picture perfection: no more and no less. If money is no object, then this is the object for you.

Adam Turner

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gtkpod 99.8

So maybe there's no iTunes for Linux, but there's little need for it with gtkpod.

GGranted, the other key functionality of iTunes is the Apple music store, but if you don't use this and instead just encode your own music from CDs, then all you really need is a simple and easy to use program to manage your iPod. And under Linux, that's gtkpod.

iPod functionality is actually quite common now under Linux, with programs like Amarok and Banshee supporting iPods, not to mention KDE's own "ipodslave" I/O slave built into Konqueror. But for Gnome, and for just managing your music collection and keeping your iPod up to date, gtkpod is quick and easy and doesn't include any extra fluff. And, unlike some other iPod-supporting music players, it allows you to do more than just transfer music — gtkpod also allows you to synchronise your calendar, contacts and notes, if you use these features, as well as create new

playlists, normalise the volume in selected tracks, automatically remove duplicated tracks, populate ID3 tag information and even re-create and restore the original iPod directory structure if you should manage to damage it (or want to wipe your iPod).

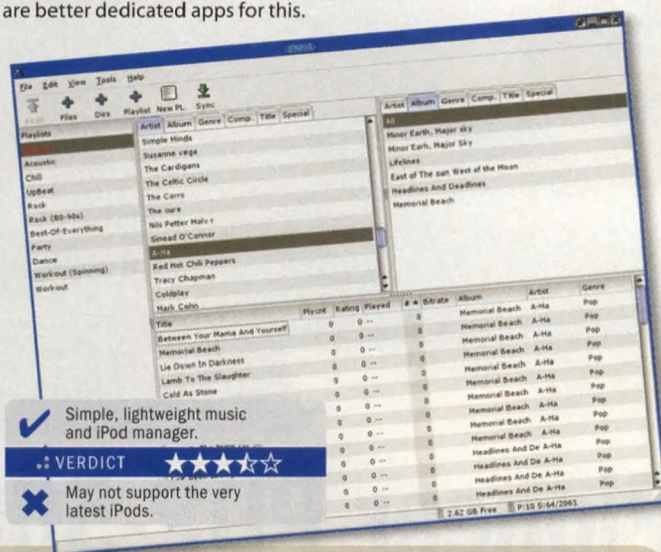
As long as your distro can automatically recognise iPods, and most do these days, using gtkpod is just a matter of running it and plugging in the iPod. While other more dedicated music players offer more features for actually playing music, gtkpod can still be used to play directly from the iPod and, in fact, the interface is similar to iTunes in terms of navigating genres and albums to find the tracks you need.

CONTACT	N/A
PHONE	N/A
ONLINE	www.gtkpod.org
MARKET	Everyone
PRICE	Free

About the only thing missing from gtkpod is the ability to rip and encode music, but as is the way with Linux and modularised programs specific to a task, there are better dedicated apps for this.

gtkpod was one of the first programs to enable Linux users to play with their iPods, and it's good to see it come this far.

Ashton Mills



✓ Simple, lightweight music and iPod manager.

VERDICT ★★★★★

✗ May not support the very latest iPods.

Gaim 2.0.0beta

Instant messaging clients have changed the world, and Gaim is one of the best.

There are a number of excellent instant messaging clients under Linux, but few have garnered a reputation like Gaim — one of the first to cater to multiple protocols (and being available

under Windows as well as Linux), it's generated quite a following since its inception six years ago.

First and foremost, Gaim supports the gamut of

modern IM systems including AIM/ICQ, Gadu Gadu, Groupwise, Jabber, MSN, Simple, Sametime, Yahoo and even IRC, although a dedicated IRC client will be better if you use IRC regularly. If you've joined more than one network and have friends on more than one network, the biggest attraction of Gaim is having one program to rule them all.

For all services you can properly configure proxies, ports, and servers unique to each, as well as individually defining your privacy options.

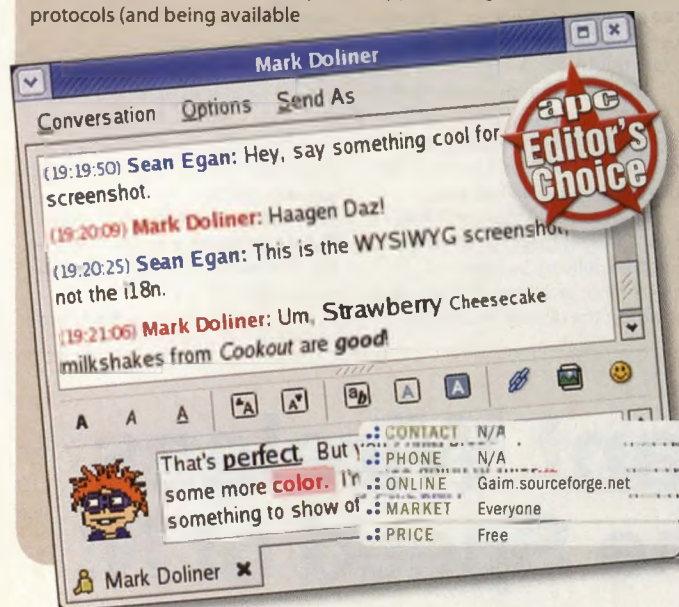
To cater to different tastes and functionality, a selection of optional plug-ins comes pre-installed and allow you to change away and buddy behaviour, tweak

the GTK+-based themes, change how you're notified of new messages, customise log and history and forge your idle time (plus, a neat "Psychic" mode pops up a message window when people start to message you).

Buddies across all networks can be broken down into groups and relationship ties and, naturally, buddy pouncing allows you to know when your friends jump on and allows you to choose one of ten ways to be notified of their presence. In fact, the level of configurability of Gaim's behaviour is one of its strengths: everything is configurable. And, naturally, it sports tray support for both Gnome and KDE.

Gaim is nearing its final 2.0 release, and while there are other GUI-based IM clients for Linux, including the KDE-based Kopete, it's hard to beat the whole package that Gaim delivers.

Ashton Mills



✓ Multi-protocol; cross-platform; easy to use; highly configurable.

VERDICT ★★★★★

✗ None, although this is still a beta release.



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WA Austin Computers 08 9201 2788 www.austin.net.au/index.asp
 Trinx Computers 08 9350 1600 www.trinx.com.au
 YNOT Computer Systems 08 9330 7666 www.ycs.net.au



HOW WE TESTED

Each package was run on two mid-range PCs. The first PC, a T2500 with 1GB of RAM, was used to represent a typical Windows system with a large assortment of programs. PCMark05 CPU testing was run to identify drops in performance; memory and disk space were monitored during virus scans and in idle states. The second PC, a 1.6GHz Pentium M with 512MB of RAM, was infected with two sets of viruses and trojans.

The first set consisted of 697 old and new viruses; the second set consisted of 633 viruses and other associated malware. Each software suite was used to scan the system, using its default scan setting, and clean it out. Speed, robustness and memory consumption were noted. Before each test the system was formatted and viruses freshly reapplied.



Defend yourself: antivirus and security suites

Peter Sbarski tests an arsenal of antivirus and security products — in order for you to see which ones you can trust.

The security problems of XP are legendary. It's incredible to think that the OS can be contaminated with spyware, trojans and viruses within minutes of connecting to the internet. Vista fixes some of these problems, though many Windows users may soldier on with XP for a while yet.

So, for now, we will continue to rely on third party software to

protect our Windows XP systems against viruses, malware, spyware, worms and other menaces. In this security Roundup, we extensively tested six antivirus/firewall/internet security suites from leading software manufacturers. In each of these applications we looked at features, virus detection ability, speed, stability, user-interface design, memory, disk

and CPU consumption, integration into Windows and cost.

A note on our virus-detection tests: not all antivirus programs detected each and every virus we threw at it (see "How we tested"). Some viruses that escaped detection came from the ancient DOS era. All modern viruses, trojans and worms, such as My Doom, Bugbear, Sircam and Sobig, were

picked up by our programs. Therefore, when selecting a suite, don't put too much emphasis on the results of the detection rate unless you are planning to go back to DOS. What's more important is the rate at which antivirus manufacturers release their virus definitions. Thankfully, these days, most antivirus manufacturers have their eyes on the ball.

ZoneAlarm Internet Security Suite 6.5.737

Most Windows users have heard of Zone Labs' excellent free ZoneAlarm firewall. ZoneAlarm Security Suite 6 is more of the same, with more security features packed in. There's a new triple-defence firewall, antispyware, antivirus, identity theft and privacy safeguards, phishing and spam blocking, email protection, instant messaging, site filtering and wireless PC protection.

The triple-defence firewall is basically a standard internet firewall coupled with an application firewall which "surrounds each software program, protecting good programs from bad" and an OS firewall which "protects the operating system — including the registry and file systems — from attack by malicious programs".

CONTACT Manacomm
PHONE (07) 3331 5999
ONLINE www.manacomm.au
MARKET Everyone
PRICE \$99.95

This triple-defence firewall definitely works. The first test machine began to regularly crash and stutter because we denied some processes access to memory. At least two crash dialogs had to be waded through after each reboot. Then the system wouldn't respond until the task manager was used to kill Windows' Dr. Watson.

ZoneAlarm's triple-defence firewall is probably a good security measure, but it needs to be configured carefully to attain the best result.

Great features; good interface; speed.

VERDICT ★★★★★

Triple defence may be tricky for some users.

An inexperienced user may panic when programs with "strange" names begin beating down the front door. On the other hand, more experienced users are likely to find it not much harder than a standard internet firewall. Download the Security Suite trial and give it a shot.

The user interface of this suite is similar to that of ZoneAlarm's free firewall, except that there are more options, including: firewall,

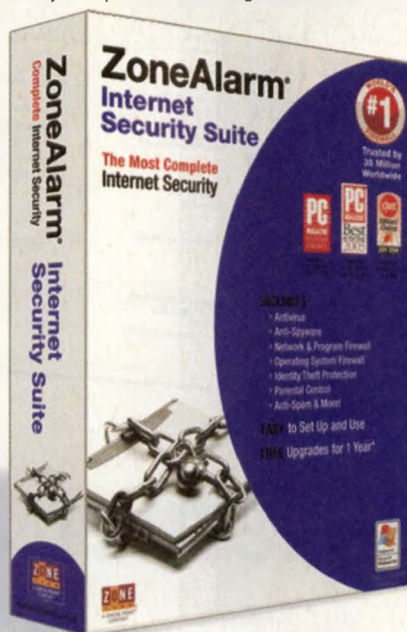
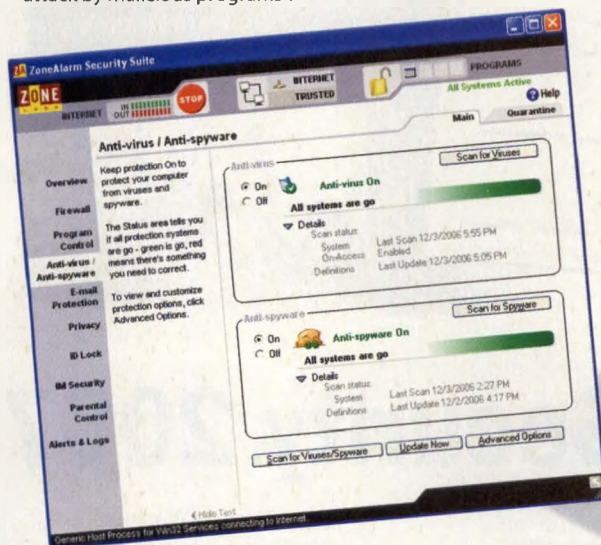
program control, antivirus/antispyware, email protection, privacy, ID lock, IM security, parental control and alert and logs.

ZoneAlarm's user interface is a pleasure to use. It's responsive and intuitive. Everything is positioned thoughtfully — it looks easy on the eye too.

The firewall and program control sections are used to specify safe network zones, configure program permissions and establish sophisticated firewall rules. The antivirus/antispyware area shows the status of the system. Here the user can also launch a manual scan, update definitions or configure advanced options. The email protection section has settings for inbound and outbound mail protection and a junk mail filter.

ZoneAlarm Internet Security Suite performed extremely well. It detected 684 viruses out of 697 in the first test and 625 out of 633 in the second. It consumed only 36,020KB of RAM idling in the background and about 48,172KB during a scan. Approximately 20 to 40% CPU load was noticed during scanning. ZoneAlarm was also extremely speedy, taking less than 25 minutes to check the whole system. PCMark scored 4,551 points in the CPU test with ZoneAlarm in the background.

ZoneAlarm Internet Security Suite is a good all-in-one solution. Providing the triple-defence firewall is properly configured, it will serve you well. Download the trial and see for yourself.



WINDOWS LIVE ONECARE

Windows Live OneCare is an attempt by Microsoft to improve the security and performance of XP and Vista. This application, which Microsoft calls a "service", consists of three main components: protection-plus, performance-plus and backup and restore. The protection component features an antivirus program and a proper two-way firewall. Windows Defender, included with Live

OneCare, takes care of spyware and malware. The performance component executes a number of standard tune-up tasks. It cleans the disk, defrags, scans for viruses, looks for files needing backup and checks Windows update. The backup and restore component creates backups of the My Documents folder and other important folders to external hard drives or writeable

optical media. Windows Live OneCare comes across as a very basic utility when compared to dedicated third party solutions. Microsoft's audience will find security suites from other manufacturers to be of better value. At the moment, Live OneCare isn't available for sale in Australia. It retails in the US for US\$49.95 (three-PC licence).



McAfee Total Protection 2007

McAfee advertises its product as peace of mind for the entire family. On offer is McAfee's 10-in-1 product protection, which attempts to stop viruses, block spyware, stop hackers, improve PC performance, back up and restore files, secure user identity, prevent spam and email scams, protect children and wireless networks and eliminate general network hassles.

McAfee's Security Center looks slick and professional. The interface is well-structured, with a menu on the left that can be switched from basic to advanced. Among the avalanche of features on offer, Maintain Computer gives the user an option to clean the system by deleting internet cache, temporary files, orphaned registry keys, old system restore points, history, cookies and so on. It works much better than Windows' Disk Cleanup utility. Another option is to defrag the disk. Here, unfortunately, McAfee calls on Windows' own defragger.

Selecting Backup and Restore opens McAfee Data Backup. Here the user can create automated archives. It seems like a fairly useful utility, especially for users without dedicated backup solutions.

The tools category includes a few interesting utilities. Shredder is used to permanently delete files and folders from the hard drive. Traffic analysis reveals inbound and

CONTACT McAfee Australia
PHONE 1800 644 646
ONLINE www.mcafee.com
MARKET Everyone
PRICE \$129.95

outbound internet traffic. Hacker Watch tracks the amount of significant incidents and port activity over the past seven days. Visual tracer geographically locates a computer by its name or IP address. Virus Map shows a "real-time, bird's-eye view of where the latest viruses are infecting computers worldwide".

Unfortunately, Virus Map didn't work for us. It took McAfee approximately

✓ Excellent features; interface is well designed.

VERDICT ★★★★★

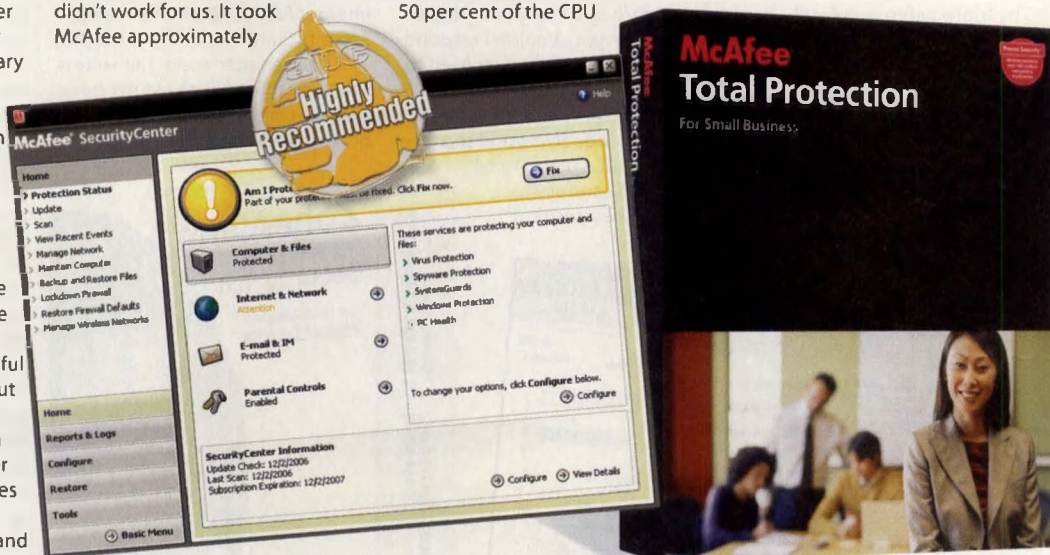
✗ Heavy on memory.

38 minutes to check for rootkits and scan through the system and the registry. Idling in the background, McAfee consumed approximately 55,332KB of RAM. During scanning this ballooned to about 133,188KB of RAM.

That is not too impressive. If you are considering McAfee but your computer is low on RAM — be wary. Approximately 20 to 50 per cent of the CPU

was consumed during scans. PCMark05 CPU testing scored 4,542 marks while McAfee was present on the system.

McAfee did very well in virus detection tests. In the first test it found 685 viruses out of 697. In the second it found 625 out of 633 viruses. This is a good result. McAfee Total Protection 2007 is a well-built application with an excellent amount of features. On the other hand, it is heavier on memory than other alternatives. If that doesn't bother you, go for McAfee — otherwise, go for Kasperky or Zone Alarm.



Norton Internet Security 2007

Among some sections of the PC community, Norton has a reputation for being bloated and resource-hungry — Symantec has tried to address this with this version.

In our tests, Norton Internet Security occupied the most amount of disk space, over 330MB, and yet didn't seem to have any extra features over other programs.

But, the user interface in Norton Internet Security is streamlined and accessible, with two main tabs at the top: Norton Protection Center and Norton Internet Security. The first shows the status of various

CONTACT Symantec
PHONE 1800 680 026
ONLINE www.symantec.com.au
MARKET Everyone
PRICE \$99.95

security activities while the Norton Internet Security window is split into four sections: Tasks & Scans, Settings, Reports & Statistics and Support. A security inspector in Tasks & Scans checks browser settings, instant messaging, IP addresses and Windows passwords for any vulnerabilities. It can also be asked to check shared folders, user

✓ Cheap; faster than previous versions.

VERDICT ★★★★★

✗ Still takes too much disk space.

rights and Windows services. Products from Symantec usually come with a good range of options, and Internet Security 2007 is not an exception. Some Personal Firewall settings come across as being rather limited, but on average everything is satisfactory. A moment of nostalgia swept over us when we saw an option, which was turned

on, to scan the floppy disk in drive A for boot viruses at shut down.

Internet Security 2007 has inbuilt protection for IM services including Yahoo!, AOL and MSN and Microsoft Office documents. The Reports & Statistics section obviously provides access to an activity log and online virus encyclopaedia. The Support section lists links to technical support.

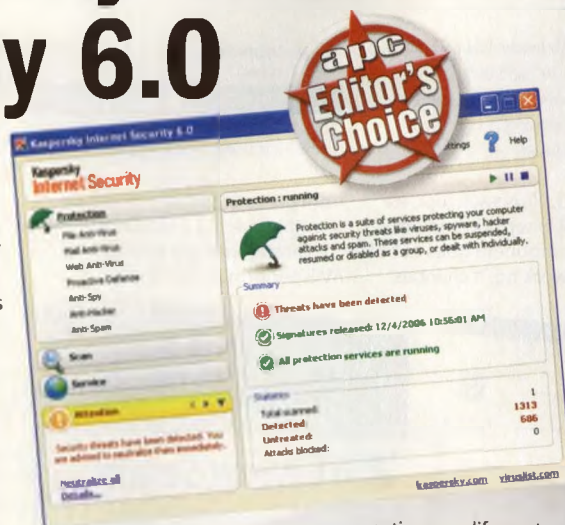
Norton Internet Security 2007 pleasantly surprised us in testing. First of all, it consumed a very small amount of memory whilst working in the background — only 11,300KB

Kaspersky Internet Security 6.0

Kaspersky is usually the favourite to win antivirus shootouts. It's always the one that can detect the most viruses and deliver new definitions in the nick of time (and it uses less memory than most of its competitors). Kaspersky's latest product is Internet Security 6.0, which combines virus, spyware, hacker, phishing and spam protection. It also comes with a firewall, pop-up, dialer and banner blocker and other assorted goodies.

Kaspersky Internet Security has a bright, cheery interface that gives access to a suite of services. Clicking on the Scan button, the user can elect to scan "critical areas", which consist of system memory, startup objects, boot sectors, the Windows folder and the system32 folder, "My computer", which consists of hard drives, system restore and system memory and "startup objects" which scans memory, startup items and boot sectors.

In the configuration window, the user can configure every element of the program, with the most interesting element being Proactive Defence. It consists of the application activity analyser, application integrity control, registry guard and office guard. The



application activity analyser looks for dangerous behaviours, rootkits and suspicious values in registries and prompts for action if it sees something. It can be configured to also look for Windows hooks, intrusion into processes and launching of internet browsers.

The application integrity control is used to configure program permissions. Here the user can forbid applications to execute

action, modify content or run as child processes. Registry Guard, also not enabled by default, is used to protect various registry groups such as system startup, security and services, as well as the HOSTS file. Finally, the Office Guard protects against dangerous macros.

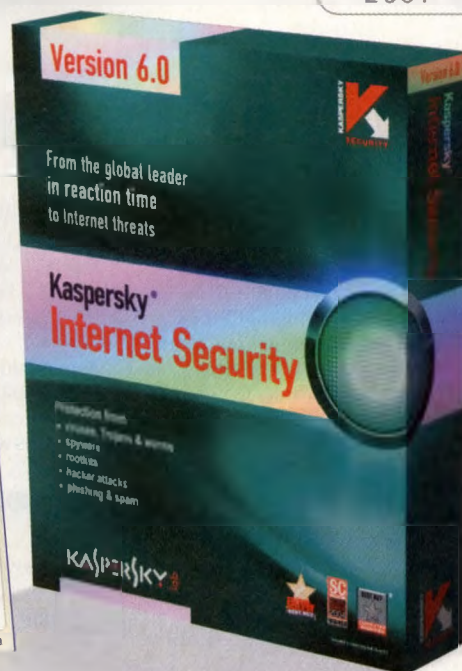
Kaspersky's memory consumption was unbelievably low during testing. While staying resident in the background, it consumed only 14,248KB of RAM.

CONTACT	Kaspersky Lab
PHONE	(02) 9676 7340
ONLINE	www.kaspersky.com.au
MARKET	Everyone
PRICE	\$94.16

✓ Effective; low CPU usage.

VERDICT ★★★★★

✗ Not as feature-rich as McAfee.

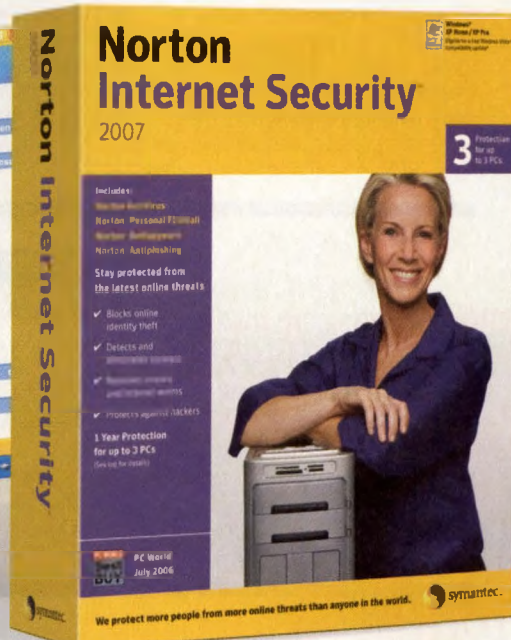
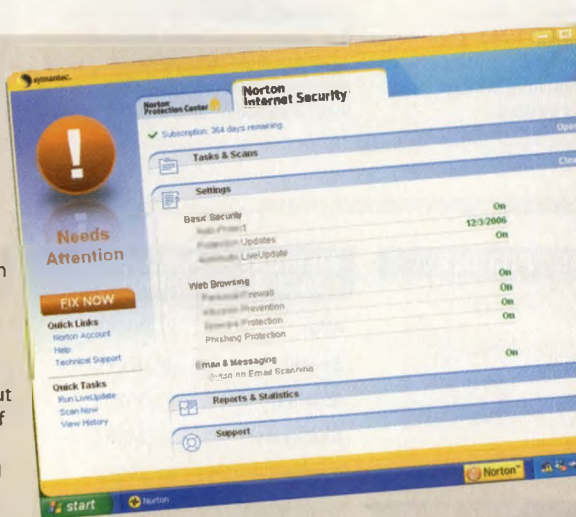


During scans it never went above 35,000KB of RAM, usually averaging about 29,360KB. CPU utilisation was about 20 to 50 per cent. The default scan was slow, taking 47 minutes and 25 seconds to finish. PCMark05 CPU testing scored 4,552 points with Kaspersky in the background.

The virus test showed that Kaspersky is a force to be reckoned with, finding 686 viruses out of 697 in the first test and 626 out of 633 in the second. If you don't need extra features such as parental controls or enhanced wireless security, Kaspersky could be your ticket. It is a nimble but powerful package and is delivered without the fat and unnecessary gimmicks.

of RAM. During scanning it consumed about 55,080KB. This is a very good result for Norton. While scanning, CPU usage did jump from about 30 to 90 per cent during some stages, but overall it wasn't bad. It took Norton 47 minutes to analyse the system. With Norton loaded in the background, the system scored 4,543 marks in PCMark05 CPU testing.

In virus detection tests, Norton did very well, finding 689 viruses out of 697 in the first test and 627 out of 633 in the second. Norton Internet Security is on the way to recovering from its recent illness, but it still needs to go through more treatment to lose unnecessary weight and learn how to clean up.



AVG Internet Security 7.5

AVG's free product, AVG Anti-Virus Free, is popular among home computer users. It's a lean, efficient and unobtrusive antivirus app. AVG Internet Security 7.5 is just like it, but with a few more features and a larger price tag.

AVG Internet Security features 12 components with varying levels of configurability, including antivirus, antispyware, antispam, firewall, scheduler,

CONTACT Avalanche Technology Group
PHONE 1300 855 005
ONLINE www.avalanche.com.au
MARKET Everyone
PRICE \$98.95

resident shield, virus vault, update manager, shell extension and email scanner. If a component goes out of date or stops working, it changes

✓ Lightweight; speed.

VERDICT ★★★★★

✗ User interface; suite needs more features.

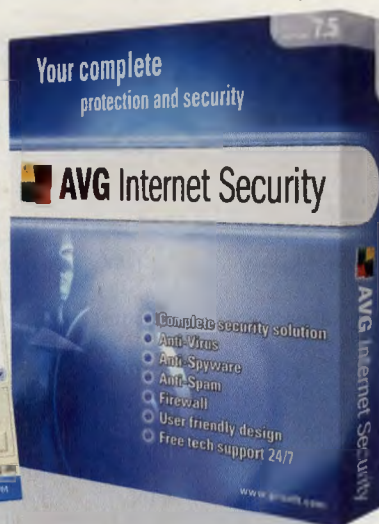
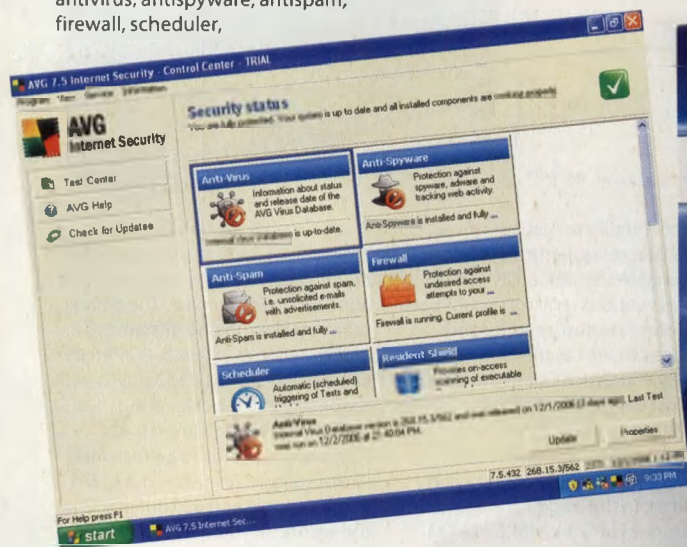
from green to red informing the user that there is a problem.

Throughout our testing, AVG performed admirably,

although it did eat into a bit more memory than we expected. In its idle state, AVG consumed only 21,900KB of RAM, but during scanning it used up approximately 71,240KB of RAM. This is better than some other programs, but we expected it to be the best. It was also unable to find all the viruses, detecting approximately 659 out of 697 in the first test and 598 out of 633 in the second.

Forty-two minutes and ten seconds was the time it took for AVG to scan through the system looking for viruses and spyware. A full scan consumed about 10 to 30 per cent of the CPU. PCMark05 CPU testing scored an impressive 4,563 points with AVG quietly working in the background.

AVG's price, only \$98.95, isn't high. However, in terms of features, user-interface design and virus detection, it is not as good as some of the other products we looked at. Give it another six months to a year and check it out again.



VISTA SECURITY

Most companies are now updating their software for Windows Vista. There is a chance that, if you buy a security suite for Windows XP now, you'll be able to upgrade to a Vista-compatible version later. Symantec has, for example, promised a free

Windows Vista-compatibility update for Norton Internet Security 2007. Grisoft has recently released AVG Anti-Virus for Vista. Trend Micro has been testing a Vista-compatible version of its antivirus product, and so have CA and McAfee.

At the time of writing, there was no word on a Vista-compatible edition of ZoneAlarm, but we are sure that it is just around the corner.

If you need to buy a security suite right now, make sure to find out about Vista upgrade options.



THE SCORES

PCMARK05 CPU (IDLE)

Fresh system:	4,573
AVG:	4,563
ZoneAlarm:	4,551
McAfee:	4,542
Kaspersky:	4,552
Norton:	4,543
Trend Micro:	4,560

MEMORY CONSUMPTION (BACKGROUND WORK)

AVG:	21,900KB
ZoneAlarm:	36,020KB
McAfee:	55,332KB
Kaspersky:	14,248KB
Norton:	11,300KB
Trend Micro:	87,844KB

MEMORY CONSUMPTION (SCANNING)

AVG:	71,240KB
ZoneAlarm:	48,172KB
McAfee:	133,188KB
Kaspersky:	29,360KB
Norton:	55,080KB
Trend Micro:	119,796KB

Trend Micro PC-cillin Internet Security 2007

PC-cillin has always been a trendy (no pun intended) antivirus. Its latest iteration keeps the legend alive, although it is slightly marred by a few performance issues. Internet Security 2007 packs a nice set of features, including antivirus security, spyware protection, personal firewall, fraud defence, home network assistance, wireless network monitoring, vulnerability assessment and advanced parental controls.

PC-cillin's interface is bright and well-constructed. Among the standout characteristics, virus and spyware scheduling is very flexible. The user can schedule tasks with

CONTACT	Trend Micro Australia
PHONE	1300 305 289
ONLINE	www.trendmicro.com.au
MARKET	Everyone
PRICE	\$89 (three users)

varying frequency and multiple targets and it's also possible to configure in-depth settings such as how many compression layers to scan in archives. The scanner itself can search for viruses, spyware and Microsoft vulnerabilities. It is possible to launch scans separately or do everything in one go.

Personal Networks & Firewall Controls deals with the firewall and wireless networks.

✓ Good interface; great virus detection.

★ ★ ★ ★ ★

✗ Sometimes eats up a bit too much memory.

The firewall allows the user to set up multiple profiles but, apart from that, it's pretty standard, and we believe the interface could have been a bit tighter. The data theft prevention system monitors instant messaging software, SMTP email messages and web pages.

PC-cillin places an antispam toolbar in Outlook; however, spam filtering is not enabled by default.

In any case, PC-cillin's spam filtering is not as sophisticated as it is in, for example, ZoneAlarm. Web site access provides basic parenting control via allowed and disallowed categories.

PC-cillin scored perfectly in our virus tests. It found all viruses in the first test and all viruses in the second. It was the only antivirus that managed to do this. It also took just over forty minutes to conduct the whole scan. Unfortunately, the perfect picture was ruined by less-than-perfect performance. Although the system scored an impressive 4,560 marks in PCMark05 CPU testing, its memory usage was high.

Idling in the background, PC-cillin consumed 87,844KB of RAM. No other security suite consumed as much memory. There were also occasional spikes in CPU usage. Memory usage went up to 119,796KB during scanning, and approximately ten to sixty per cent of the CPU was consumed at different stages. PC-cillin's peak memory usage was less than McAfee's, but it was still too high.

PC-cillin Internet Security 2007 leaves a nice impression. It has nearly everything one could need — and in virus tests it shows that it is the best. If only Trend Micro could get PC-cillin's memory usage down, it would definitely be one of our main contenders for the Editor's Choice award. Unfortunately, this time, it just misses out.



Norton AntiVirus™
2007*

*6 months subscription version

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Microsoft®

Vista

upgrade superguide

Top 10 reasons why: You should care about Vista

Microsoft's official publicity material talks about Vista's "richer experience" and "getting ready for a new day". Cut the crap! Why should you really care about Vista?

The early beta versions of Vista included some bold features which were dropped for the sake of familiarity in the final version, but there's still lots to appreciate about the "RTM" (Release to Manufacture) version of Vista. And we're not talking here about eye candy or security — we figure APC readers already knew how to run a secure XP box and how to de-Fisher-Price it. Here are the real benefits:

1 USER INTERFACE BUILT FOR THE ERA OF VIDEO AND DIGITAL PHOTOS

Photos, videos and music are not treated the same as Word documents any more. When you open a folder of photos, they come up as they'd appear in Google Picasa or Apple iPhoto. There's inbuilt basic photo editing. Music folders come up in columns of ID3 tags, a bit like iTunes. Finally, you don't have to rely so much on third party apps to work with your files.

2 IMAGE-BASED INSTALL

PC enthusiasts spend a lot of time installing and reinstalling Windows for their own and other people's PCs. The Vista DVD is actually a pre-installed version of the OS in a compressed form, making it substantially quicker to install. It's also much easier to customise for unprompted installation with the correct defaults, and you can even install your own software automatically at the time Vista is installed — like slipstreaming service packs but on steroids.

3 UP-TO-DATE DRIVER BASE AND BETTER DRIVER HANDLING ON INSTALLATION

Enjoy the just-baked driver base while it lasts. If you do need to use a special disk driver during installation in the future, it won't have to be on floppy disk. Now you can use a USB memory key or CD.

4 DESKTOP SEARCH AND SEARCH FOLDERS BUILT IN

Yes, you could already get umpteen desktop search apps for XP, but you can't underestimate the importance of it being installed on every single Vista PC. Now when your mum rings saying she's lost a document she's been working on all day you can just direct her to the start menu. Also, desktop search folders are handy.

5 SLEEP MODE THAT ACTUALLY WORKS

It's a small thing, but makes a big difference: Vista has finally caught up to operating systems that can sleep near instantly and wake up reliably, in a couple of seconds.

6 ROCK-SOLID LAPTOP ENCRYPTION

The data on your laptop is worth a hell of a lot to an identity thief. Vista's "Bitlocker" encryption (only in Enterprise and Ultimate versions) does heavy-duty, full-drive encryption, so you can be certain that unless a thief has your password, there's simply no way they're going to get in.

7 BETTER FILE NAVIGATION

Vista has some time-saving features like favourite folders displayed on the left of every Explorer window, as well as "breadcrumb" folder lists allowing you to quickly jump backward and forward through a path. Sure, these features should have been in Windows years ago (at least they're here now).

8 INBUILT UNDELETE

Or, depending on how you look at it, inbuilt rolling backup. Every time you make a change to a file or delete it, Windows keeps the previous version. As a result, the "oh !@#\$ I just overwrote my PhD with Document 1" feeling can be very quickly assuaged.

9 DIRECTX 10

OK, this isn't so much a benefit as your hand being forced: DirectX 10 will never be made for XP, and a raft of games have already been announced "exclusively" for 10. Admittedly, it does take gaming graphics to the next level, but it's very much tied to Vista.

10 FACE IT, YOU HAVE NO CHOICE

When Microsoft brings out a major renovation to Windows, you can choose to ignore it for a while, but then the device drivers start drying up for older versions of Windows and your friends start asking questions about their new PC that you can't answer. Face it: your arse belongs to Redmond.



The long road to Vista

MAY 2001

– Longhorn development started. Expected release date: 2003.

OCTOBER 2001

– Windows XP released.

JUNE 2002

– Milestone 1 released. Based on XP codebase.

JULY 2002

– Milestone 2. First leaked build with the temporary "Plex" visual theme.

SEPTEMBER 2002

– Milestone 3. Longhorn XP Professional build released. Sidebar makes first appearance. It was possible to move the Start bar onto it and disable the taskbar altogether.

SEPTEMBER 2003

– Build 4029 leaked. The build was oddly named, "onghornLay rofessionalPay". Microsoft claimed this was to test new code that minimised the number of instances of the product name variable.

OCTOBER 2003

– Microsoft releases a build that dumps the "My" prefix before the Documents, Music, Computer folders, etc. Hooray... now we just had to convince them to kill the dog with the wagging tail...



FEBRUARY 2004

– Virtually all Vista programmers diverted to fix XP security with SP2.

MAY 2004

– First build with Aero 3D effects included.

AUGUST 2004

– XP SP 2 released.
– Microsoft announces major overhaul of Longhorn. Starts again with Windows Server 2003 codebase.

JULY 2005

– Microsoft announces "Vista" name – "a clearer view of your files".
– Vista Beta 1 released. Virtual folders make their appearance but feedback tells Microsoft that users don't understand what they do.



SEPTEMBER 2005

– Windows chief Jim Allchin tells the *Wall Street Journal* the Vista project was "crashing to the ground" due to haphazard development methods.

MAY 2006

– Vista Beta 2 released. Allchin damns it from the outset by demonstrating to a room full of journalists how many authentication prompts in a row show up when deleting an icon from the desktop.

SEPTEMBER 2006

– Vista RC1 released. The first build of Vista that most people felt was basically usable day-to-day on a work PC.

OCTOBER 2006

– Vista RC2 released.

NOVEMBER 2006

– Vista final build pirated before released to anyone outside Microsoft (and activation workaround released).
– Final Vista code released to manufacturing, developers and PC manufacturers.



DECEMBER 2006

– Vista released to business volume licence customers.

30 JANUARY 2006

– Release of Vista to end users.

Some information and pictures sourced from Wikipedia: <http://snipurl.com/14c3h>.

ESSENTIAL SOFTWARE COMPATIBILITY

If you tried out any of the Vista betas, you'll probably have run across some key software that wasn't Vista-compatible at the time. Here's the status of key apps to get your new Vista installation up and running:



FIREFOX 2.0 – Firefox 2.0 runs fine under Vista. We encountered the occasional quirk when clicking a link in an email or initiating web-based apps from the Start menu in Vista, but otherwise it runs fine.

ACROBAT 8 – At the time of writing, a beta of Adobe Reader 8 with Vista compatibility was available from Adobe. In our experience, Reader 7 worked fine though.



FLASH 9 – Flash Player 9.0.28.0 is compatible with Vista.

NERO – Nero 7 Premium Reloaded edition version 7.5.9.0A is Vista-compatible.

AVG ANTIVIRUS – AVG Free 7.5.430 (32-bit) is Vista-compatible. For more, see <http://snipurl.com/14c1y>.



10%

The number of PCs that will be using Vista by the end of this year.

Source: Gartner.

Your official APC Vista upgrade guide

Vista is ready, but are you? Nick Race, Dan Chiappini, John Gillooly and Nathan Davis get ready to go Ultimate.

It's been a very long time since we first mentioned Windows Vista (née Longhorn) in the pages of APC. Since the first community previews and betas, it has undergone many changes, facelifts, improvements and downgrades. But finally it has arrived, set in stone (all eight versions), so it's time to evaluate just what you'll need to get the most out of the version of Windows Vista you choose.

With every operating system, there's a minimum system requirement, which usually gives you minimal performance. In this guide we'll cover the hardware upgrades that will let your PC run Windows Vista Ultimate, the top-of-the-line version of the new operating system — but we'll also spell out necessary upgrades for the less feature-rich versions of Vista available on the market.

The minimum specification for the simplest home user version of Vista, Vista Home Basic, is not impossible. It asks for an 800MHz x86-compatible processor, 512MB of RAM, a 20GB hard disk drive and a super low-end 800 x 600 compatible graphics adaptor. It means that any PC built in the past five years (with a bit of a RAM upgrade) is technically capable of running the Basic version.

But using Vista Basic (remember, which doesn't even include the fancy Aero graphics) with a machine at that specification will be a painful and frustrating process. A more reasonable build of a 1.2GHz and above processor with 1GB of RAM and a semi-modern graphics adaptor, even as low-end as an Intel 915GM or a 2D Matrox video card, will offer much greater performance and at least offer some modicum of productivity.

Jumping up to Vista Home Premium sees new requirements pop out of the woodwork. Though Microsoft claim the same specifications for the CPU, RAM and hard disk drive, Home Premium ups the requirements for a graphics adaptor, requiring it to support a DirectX 9-compatible device. This is purely for the Aero desktop, which runs in 3D.

But once again, you'll want to ignore the minimum specification recommended by Microsoft. If you're planning on running Aero with Windows Vista Home Premium, then, as an absolute minimum, you'll want a 1.2GHz processor, 1GB of RAM and an ATI or Nvidia-based graphics adaptor manufactured in the past two years. More recent Intel motherboard-based graphics solutions are also capable of running Aero comfortably, but if you

computer includes that, then you're likely to exceed our minimum specs as a matter of course.

Vista Ultimate is the version with all the features. It too has its own minimum specs. For tuning in to its Media Center component, you'll need a compatible tuner card, with a MS-approved remote control. Microsoft also recommends 1GB of RAM, so working by our rule of thumb, you'll want 2GB to make it run well.

Ultimate also uses what Microsoft terms BitLocker Drive Encryption, which allows you to encrypt your hard disk drives. So, if the worst should happen, a lost or stolen PC or notebook, then no-one can access your data without the right password or key. For BitLocker, you'll need a TPM module (which are rarely found on consumer-level motherboards and notebooks) or a USB 2.0 key, which everyone should be able to rustle up.

We mentioned our rule of thumb a while back, and we're going to dare to call it an axiom. Whatever minimum system requirements are stated for a piece of software by the vendor, double those requirements to get the real minimum requirements for satisfactory performance.

VISTA VERSION	MICROSOFT'S MINIMUM	APC'S MINIMUM
HOME BASIC		
CPU	800MHz 32-bit (x86) or 64-bit (x64) processor	1.2GHz Pentium 4 or Athlon 2400 and above
RAM	512MB	1GB
Hard disk	20GB (15GB free)	20GB (15GB free)
Graphics	800 x 600 capable	Discrete graphics adaptor, or Intel 915GM and newer
HOME PREMIUM		
CPU	800MHz 32-bit (x86) or 64-bit (x64) processor	1.2GHz Pentium 4 or Athlon 2400 and above
RAM	512MB	1GB
Hard disk	20GB (15GB free)	20GB (15GB free)
Graphics	800 x 600 capable	AMD or Nvidia discrete graphics adaptor less than two years old
ULTIMATE		
CPU	800MHz 32-bit (x86) or 64-bit (x64) processor	2GHz Pentium 4 or Athlon 2800+ and above
RAM	512MB	2GB
Hard disk	20GB (15GB free)	20GB (15GB free)
Graphics	800 x 600 capable	AMD or Nvidia discrete graphics adaptor less than two years old
Other — BitLocker	TPM module or USB 2.0 drive	TPM module or USB 2.0 drive
Other — Media Center	Single tuner with MS-approved remote	Single tuner with MS-approved remote

Part one Motherboard – CPU

Nick Race checks out the best motherboard and CPU combinations in order for you to get Vista running to its full potential.

The lowest spec in Vista's wishlist is the CPU, though it's been one of the fastest developing PC components since the inception of the industry. It seems Microsoft views the CPU as secondary to the other components you may need to upgrade to run Vista, since the requirements are so undemanding (presumably to increase the number of computers that fit those requirements).

XP Professional, for example, only requires a 233MHz processor to run. The ante has barely been upped in Vista, where an 800MHz processor is minimum, with no recommended speed to be seen. Our recommendations are different, however. APC believes the minimum CPU speed for Vista should be 1.2GHz — a 50% increase over Microsoft's recommendation. In reality, there's not much difference in day-to-day tasks between a chip running at 800MHz and 1.2GHz under Vista, but a little headroom is always warranted.

Our testing with the release candidates and RTM versions of Vista shows the key influences on the performance of the system rests on the amount of RAM available and the speed of your hard disk drive. And if you want to run Vista Premium or Ultimate editions, 3D graphics and DirectX 9 performance are critical also.

DirectX 9-compatible hardware now mainly uses the current PCI Express market standard. Though there are a limited number of graphics adaptors that use AGP (the last-gen method of interfacing graphics adaptors to a PC), PCI Express' performance over AGP is dramatic and almost a necessity. So, ensure PCI Express 16x compatibility when choosing a new board.

A special note must be made for motherboards with built-in graphics — most modern boards connect the onboard graphics using PCI Express lanes and are thus able to take advantage of the much wider bandwidth available with PCI Express, but it's not always the case, so make sure you do your homework. Here we present an AMD and an Intel motherboard and CPU solution that will give top performance with Vista Ultimate at reasonable prices.

MSI K9N PLATINUM AM2 MOTHERBOARD AND AMD ATHLON X2 AM2 3800+ CPU

The K9N Platinum motherboard from MSI is a great board with plenty of performance at a very reasonable price. This particular model is based on the Nvidia nForce 570 chipset, the mid-range chipset from Nvidia's last generation. (The new 680i is a high-performance model that costs

much extra for extreme overclocking features not necessary for Vista.)

It supports the new generation of AMD Athlon X2 processors on the AM2 socket with support for DDR2. If you're upgrading from an older Athlon, keep in mind you'll need new RAM, as plain DDR is no longer supported on the AM2 platform. The K9N Platinum board includes a single 16x PCI Express slot for graphics, two PCI Express x1 slots for expansion, plus three PCI slots for older expansion cards like sound cards, USB expansion cards and internal modems. There isn't any support for twin PCI Express graphics or SLI. This board has a single IDE port, ostensibly for an optical drive, so beware if you're upgrading from a PC without SATA drives (the board supports six SATA drives with built-in RAID).

The AMD Athlon X2 3800+ is the current price-to-performance sweet spot for AMD processors. You'll be able to find one for less than \$300 and the performance of the 3800+ is more than adequate for Vista Ultimate. The dual-core nature of the processor will help with HD content encoding and decoding using the MCE component (and will still have enough overhead to keep the system responsive for other tasks).

Of course, this part is just price consideration,

and going for a higher-powered or slightly lower-speed part, based on your budget, will still work just fine. Keep in mind when buying your motherboard and CPU combination that the new Athlon X2 models, like this 3800+ (and the 4000+ series chips) require DDR2 memory.

INSIDE INFO

● MSI COMPUTERS

Phone: (02) 9748 0070
 Web: www.msicomputer.com.au

● AMD

Phone: N/A
 Web: www.amd.com

ASUS P5B SOCKET 775 MOTHERBOARD AND INTEL CORE 2 DUO E6400

The ASUS P5B motherboard is a basic but not underspecced motherboard for Core 2 Duo and Core 2 Quad processors. It uses the Intel P965 chipset, in lieu of an Nvidia or VIA solution, so it does cost a little more than some other Core 2 Duo boards on the market. It's worth considering though, as the Intel P965 chipset has proven very reliable, and certainly has the performance required here.

The P5B supports CPUs up to 1,066MHz frontside bus and DDR2 memory up to 800MHz. It has a single PCI Express x16 lane for a graphics adaptor, plus three PCI slots for add-on cards (like sound cards, TV tuners and whatnot). There's three PCI Express x1 slots available for future expansion. Just like the AMD solution above, the ASUS P5B board only has one parallel ATA drive connector, so you'll need to run the system using SATA hard disk drives (of which six are supported).

If you're buying now with thoughts of upgrading in the next 12-18 months, then this board is a good choice, as it fully supports Core 2 Quad processors which will be available shortly.

The Intel Core 2 Duo E6400 is the best price/performance CPU in the Intel stable at the



SYSTEM PERFORMANCE RESTS ON THE AMOUNT OF RAM AVAILABLE AND THE SPEED OF YOUR HARD DISK DRIVE

moment. It runs at 2.16GHz and holds 2MB of L2 cache. Interestingly, the E6400 is the current pick for the enthusiast overclocker market: its cheap price and very high headroom can see a user get much more performance than they pay for.

As with the AMD solution above, there's no reason why you can't choose a higher or lower-rated CPU, depending on your budget. This Intel solution in general is more expensive than the AMD solution presented above, mainly due to the more expensive motherboards for Intel processors — but it will be faster.

INSIDE INFO

● ASUS

Phone: 1300 278 788
 Web: www.asus.com.au

● INTEL

Phone: N/A
 Web: www.intel.com

EVGA NVIDIA 680i MOTHERBOARD AND INTEL CORE 2 QUAD EXTREME CPU

If you're willing to spend the money, and lots of it, then there's no faster solution at the moment than an Nvidia 680i and a quad-core Intel processor. Especially if you plan to fiddle around with some overclocking.

Nvidia's new 680i chipset is designed from the ground up for very fast operation, flexibility and stability — the combination that performance enthusiasts want to hear. It supports Intel Core 2 Duo and Core 2 Quad processors, DDR2 memory ostensibly at 800MHz (but actually much faster) and has endless options for tweaking memory, chipset and CPU performance built in.

For a further boost, use Enhanced Performance Profile (EPP) memory from enthusiast memory manufacturers like OCZ, Corsair and Gell, which will allow for the automatic and hands-off overclocking of the RAM, which can certainly speed things up a bit. The board itself supports SLI for a dual-graphics card setup, six SATA hard disk drives (but again, only one PATA connector) and a swathe of PCI Express and PCI ports for add-on cards.

The Core 2 Quad Extreme is the current top-of-the-line Intel processor, combining two lauded Core 2 Duo cores on to a single die. Though it is the top of the line and thus the most expensive — if you're not planning on doing heavy video work (or really giving the MCE component of Vista a run for its money), then you might also want to consider the slightly cheaper Core 2 Duo Extreme, which has half the cores (but runs them faster). The Core microarchitecture was the biggest thing to happen for desktop computing in 2006, so using the pinnacle of the microarchitecture to run the newest operation system of 2007 makes plenty of sense.

Just remember, if Core 2 Quad is for you, it runs very, very hot, so make sure your chassis is well-ventilated and there's a good-quality copper-cored CPU cooler installed for stability.

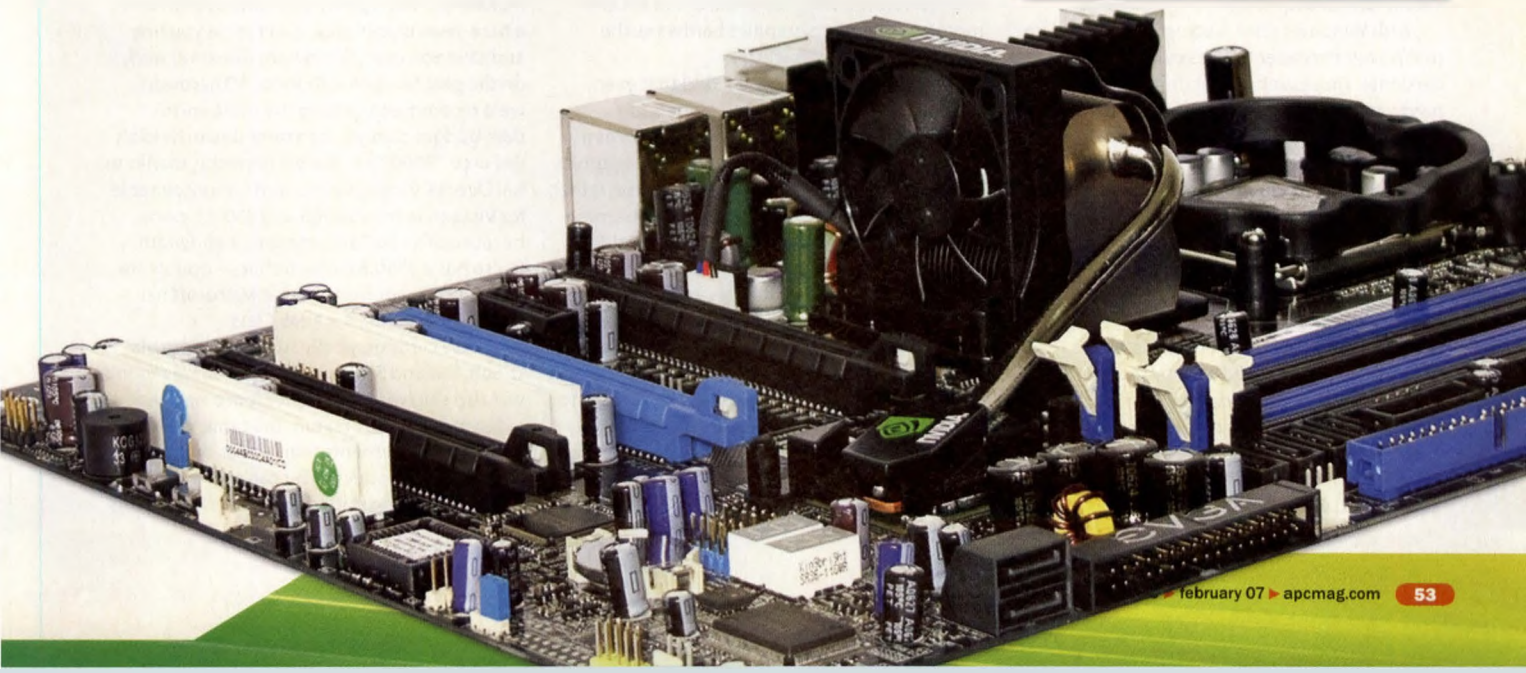
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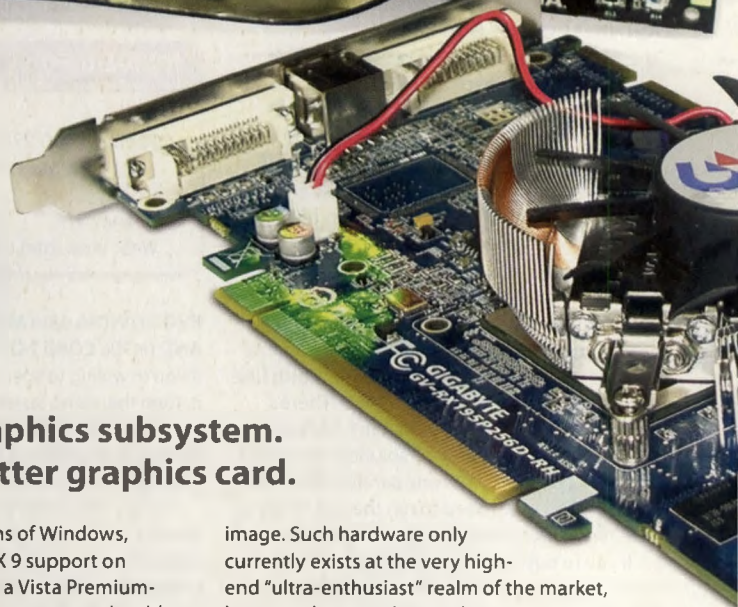
● SHADOW ENTERTAINMENT

Phone: (03) 9785 6570
 Web: www.shadowentertainment.com.au

● INTEL

Phone: N/A
 Web: www.intel.com





Part two Graphics cards

Vista's greatest impact will be on a PC's graphics subsystem. John Gillooly explains why you'll need a better graphics card.

In previous generations of Windows, the distinction between 2D and 3D graphics operations was always quite strong. 3D acceleration was borne from the gaming community and has always been largely about faster, prettier games. What this has led to is incredibly complex and powerful processors sitting idle for a lot of the time inside PCs.

With Windows Vista, Microsoft is leveraging that power to render the desktop (in all versions). Those with recent generations of hardware are able to run the Aero Glass desktop.

In order to do this, a graphics card needs to meet certain requirements. It needs to pack enough processing power to render the desktop, as well as having enough memory bandwidth. Insufficiencies in either camp will result in a sluggish desktop and will make the Aero experience a painful one.

There are plenty of options around for hardware that supports Aero Glass. Even a relatively low-powered card by today's standards can keep Windows looking pretty. Where additional power comes into play is in the applications being run on top of just the desktop — in the vast majority of cases, this means gaming and video playback.

Unlike previous versions of Windows, the requirement of DirectX 9 support on graphics cards means that a Vista Premium-capable PC will happily run games at playable frame rates. For improved image quality and higher resolutions, gamers will want a higher-end graphics card. In this regard, nothing has changed with Vista — as a rule of thumb, the more you spend on graphics hardware, the prettier your pictures will be.

For video decoding, you'll find that even a base-level card will deliver competent performance. Those wanting to use Vista as a media centre will not be worried about graphics card performance in the traditional sense; rather, it will be specific on-card features that become the determining factor. This includes dual-link DVI for large displays, HDMI for connection to HD televisions and proper on-card support for High-Bandwidth Digital Content Protection (HDCP) encrypted video.

Moving forward, the next-generation DirectX 10 graphics hardware is specifically designed to work with Vista. These cards are architecturally different (yet backwards-compatible) and open up potential for general-purpose computing applications that go beyond the onscreen

image. Such hardware only currently exists at the very high-end "ultra-enthusiast" realm of the market, but over the next six months we expect to see it flow into all market segments.

ENTRY LEVEL — NVIDIA GEFORCE 7300GT

If gaming is not a priority for your system then a base-level graphics card will serve you fine and save you cash. While Aero Glass will work on the past few generations of 3D hardware, we'd recommend getting the most up-to-date budget card you can track down. Nvidia's GeForce 7300GT fits the bill perfectly, thanks to full DirectX 9-compliance, and is more suitable for Vista than the 7300GS and 7300LE cards because of its 10.7GB/s memory bandwidth. It also has a 256MB frame buffer — double the base 128MB requirement that Microsoft has deemed necessary for Aero Glass.

These cards generally support output via D-Sub, DVI and S-Video, although some models will also ship with an adapter for component video output. They feature the same video quality enhancements seen across the range of GeForce 7 products. You can even run two 7300GT cards in SLI mode, although this seems

somewhat pointless considering that SLI is a gaming technology.

Besides the cheap cost, the other advantage of going for a low-end product is the reduced heat output of the graphics card. There are several models of 7300GT on the market that are passively cooled, which makes for silent graphics card operation.

MID-LEVEL — ATI RADEON X1950 PRO

Great all-round cards don't cost the earth, and the Radeon X1950 Pro is a perfect example of this. Priced at less than \$400, this card is based upon ATI's current top-of-the-range product and is capable of not only delivering the Aero Glass experience but also pumping out some very, very pretty images in games.

It differs from the high-end XT and XTX models in four key areas: it has 36 pixel shaders to the high-end card's 48; it has lower clock and memory speeds; it has 256MB of RAM as opposed to 512MB on the other cards; and it supports CrossFire without the need for external cabling or special master cards (on CrossFire-supporting motherboards).

It has ATI's AVIVO HD video decoding technology

and supports dual-link DVI, HDCP and video out via an adaptor. For those still using monitors with D-Sub connections, the cards ship with plug adaptors.

For those consumers wanting a great gaming experience (with all the bells and whistles of Windows Vista, as well), this is currently a very compelling balance of price and performance. The ability to use two of these cards in CrossFire configuration — with ease and simplicity — even makes it a very real competitor to its higher-end, slightly more powerful brethren.

HDMI CARD — ATI RADEON X1600 HDMI

For those wanting to use their Vista PCs as media centres, there are some slightly different requirements for desktop or gaming use via



AS A RULE OF THUMB, THE MORE YOU SPEND ON GRAPHICS HARDWARE, THE PRETTIER YOUR PICTURES WILL BE

a monitor. While most modern cards are capable of decoding high-definition video content, output is a much more nefarious proposition. Because of changes to the way Windows deals with video, which is driven predominantly by the need to protect copyrighted content, outputting to a television is much more complex.

For the best future-proofing of a Vista media centre, we recommend using a card that supports an HDMI output.

If you are just outputting to a monitor, DVI works; however, for proper compliance with the HDCP copyright system, you'll need to connect via HDMI. This is not an immediate concern, as the lack of HDCP-supporting hardware has meant copyright holders are still reticent to unleash the system on the public; however, it has a certain inevitability to it.

ATI's Radeon X1600 Pro card with HDMI has respectable mid-range performance paired with support for HDCP. There are several manufacturers who make such cards and, ultimately, the choice is personal — for a media centre we'd recommend one that uses a passive cooler, though, to minimise system noise in the living room.

DIRECTX 10 — NVIDIA GEFORCE 8800 GTX

Nvidia was first to unveil its DirectX 10 hardware in the form of the GeForce 8800. This uses a processor that is fundamentally different to what has come before. Rather than a simple arrangement of parallel shading pipelines, the 8800 features an array of 128 processors that are highly programmable and versatile.

This means, in current games, you'll experience best-of-class performance —

there is no DirectX 9 hardware that can touch the speed of the 8800. But more importantly, when the jaw-droppingly beautiful range of DirectX 10 games finally hit the market, you'll be well-placed to get the most out of your gaming PC.

This is the first true Windows Vista graphics card. It supports HDCP and dual-link DVI for HD video playback, while its DirectX 10 support means great gaming performance as well as the ability for the card to perform non-graphics tasks like physics calculations.

Putting such a card into anything other than a high-end machine is overkill, though — more reasonably positioned products will undoubtedly begin to appear over the next few months. It also has high-power requirements

and you will need to make sure you have a suitable power supply driving it.

For now, this is both the most Vista-ready graphics card on the market and, more generally, the fastest graphics card you can get for any platform. If you demand the best, then look no further than the GeForce 8800 GTX

AGP — NVIDIA GEFORCE 7800 GS

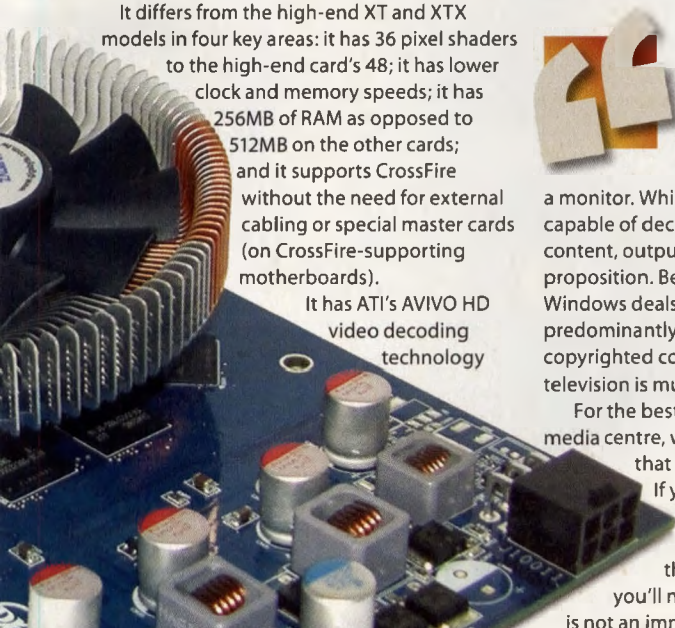
Windows Vista is an operating system that gets a lot from the bandwidth advantages inherent in PCI Express. With such constant video card use, the speed, bandwidth and two-way nature of PCI Express really come into their own.

However, those who have a fairly recent AGP-based system can feel left out in the cold somewhat. With motherboards and graphics cards nearly exclusively supporting PCI-E over AGP, there's not a huge amount of choice out there if you want to get Aero Glass running without a complete system rebuild.

The flood of PCI-E products mean the choice of AGP card is limited to a mere handful of products. Currently, the best-performing AGP card that's widely available is the Nvidia GeForce 7800 GS — an AGP-only product SKU that is available from a wide range of vendors.

It is a niche product, but one targeted firmly at those wanting an upgrade to extend the life of their system (rather than those looking to build a new one). The simple reality is that PCI-E is here to stay — and already, most manufacturers have moved beyond AGP in anything other than the ultra low-end space.

The 7800 GS is expensive when compared to PCI-E cards but still delivers respectable mid-range performance. It will also be most likely the last AGP card you ever buy, as graphics hardware is rapidly moving beyond the meagre bandwidth that AGP can provide.



INTEGRATED GRAPHICS

Integrated graphics solutions have traditionally sucked when it comes to 3D rendering. However, the cost benefits of integrated solutions, especially in a business environment, mean that they are highly desired. Over the past year, all the significant chipset players have been working on integrated solutions that have enough 3D processing power to render Aero Glass — and the ability to connect internally via the PCI Express bus enables enough memory bandwidth to do this.

Integrated graphics won't be the ideal solution, especially on a system running Vista Home Premium or greater, because they are simply way too underpowered. If you want to run 3D-intensive applications. If you just want a decent media box and don't need HDMI/HDCP output, then you'll find there is a new wave of product hitting that will deliver. This includes Intel's 965G chipset — and also impending products from ATI and Nvidia.



Part three Hard drives

John Gillooly takes a look at what to consider when upgrading your hard drive.

Choosing hard drives for Vista involves a balance of speed and capacity. Microsoft recommends a 40GB drive with 15GB of hard disk space for a Vista Premium install; however, as we all know, the amount of space taken up by the OS is only a fraction of the total that gets used. The actual amount of disk space needed depends on your intended usage. Those focused on the creation and consumption of digital media will want to maximise capacity, while normal day-to-day users will find a single drive sufficient.

There are two choices to make in terms of speed: high-capacity 7,200rpm drives or lower capacity 10,000rpm drives. The hard drive is one of the biggest bottlenecks in a modern PC; performance improvements are noticeable.

That said, 7,200rpm drives are fine for everyone but the most hardcore users. If you fall into this category, then using a single 10,000rpm drive for the OS and a 7,200rpm drive for storage will be the best mix of speed and capacity.

BEST BANG FOR BUCK

Hard drive pricing has always had a stepped profile, with huge price jumps between some capacities. This is due to the physical number of platters within the drive — at some point,

increasing capacity will mean adding another platter, which bumps the cost up.

Currently, the sweet spot in hard drives is 320GB. This holds true for all manufacturers, with a significant jump in cost coming with a move to 380GB+ models. We are referring specifically to 7,200rpm drives here, as the only desktop 10,000rpm drives come from Western Digital and have a premium pricetag (with a 36GB model priced similarly to a 320GB 7,200rpm one).

We'd also recommend Serial ATA drives rather than Parallel ATA ones. Most modern motherboards come with only one or two Parallel ATA channels (for optical drives), but six to eight SATA channels are common. While SATA doesn't deliver a performance boost *per se*, it is the standard drive interface moving forward (PATA may not be supported next time you upgrade).

As for which hard drive to buy, it really depends on what you can access, personal brand preference and pricing. Drive prices do fluctuate with demand, so it pays to shop around.

RAID

A large number of motherboards now come with SATA RAID support built directly into the chipset. RAID is one way of overcoming the mechanical

performance limitations in hard drives by splitting the load across two of them. It is also being pushed more and more as a way of keeping your data safe — something that increases in importance as more and more valuable memories are stored on a PC.

The two most common raid types can help to do this. For speedups, RAID 0 is the choice. In this, data is "striped" across drives (alternate blocks are written to each drive). If data redundancy is needed, then RAID 1 is for you as it mirrors data onto a second disk as it is written. There are also implementations of RAID 5 and RAID 0+1 available on some motherboards, adding combinations of the above functionality.

What you need to remember for RAID is that it takes, at a minimum, two identical hard drives. If you are striping, then you still have access to the entire space on both drives; however, mirroring will effectively leave you with only one drive's worth of space with which to play.

While RAID has been greatly simplified of late, you will need to investigate your specific hardware and work out exactly what support you have and how to set it up. A lot of motherboards now come with separate RAID setup booklets which will get you on the way.

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* "Windows Vista Premium Ready" meets Microsoft Windows Vista Premium hardware requirements



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Part four RAM

Don't trust Microsoft's memory recommendations for Vista. Dan Chiappini says double them.

Microsoft recommends a minimum threshold of 512MB to even be eligible for installation, and we're thinking you'd have to be pretty sadistic to accept that if you want all the new graphical features. 1GB of memory is the minimum spec for a Vista Premium experience and, reading between the lines, you'll want at least two gigabytes to provide all the eye candy.

If you're holding onto your existing machine, either an Intel or AMD-based box clocking in at 1GHz or above, and you have less than 1GB of memory, now is the time to splash out on some new DIMMs. On the other hand, if you currently meet the spec, you may want to hold out, install Vista and gauge your experience before you try and track down some cheap DDR. One of your biggest problems may come from your hardware config, in that many boards, especially at the cheaper OEM level, only include two slots for memory. If both banks are full, you're going to have to not only buy new memory to expand, but you may need to replace the current stuff to roll the existing RAM into one piece.

BEST-VALUE RAM

For current-generation DDR2 machines looking for a quick boost (to hit 1GB, or to push for a second gig to further smooth out the operating

system performance), the price-to-performance ratio is a big factor in your purchasing decision.

Since RAM is the lifeblood of any strong system and generally provides the single biggest upgrade for memory-intensive applications, how much are you going to need come launch? There are plenty of cheap memory module vendors, many of which should be avoided at all costs. Corsair is far and away the best performer and its Value Select range of RAM is available in 256MB, 512MB, 1GB and 2GB packs, giving buyers the option to cater to all current setups.

It's obviously not the crazy overclocking memory enthusiasts are going for in their water-cooled PC, but it may be the last piece to get you over the line for Vista compatibility (and provide the full Aero experience).

BEST-PERFORMANCE RAM

This isn't your grandma's computer RAM we're talking about. Corsair's XMS2 DOMINATOR memory is exactly what the name suggests

— and is about as crazy as memory gets. With its massive shredded heatsinks extending beyond the height of the sticks to help remove heat from the modules and PCB, this memory isn't for the faint of heart or the frugal of wallet.

Clocking in at 1,111MHz and quoting PC-8888 speeds, it's the perfect partner in crime for gamers, overclockers and PC tinkerers looking to wring every last ounce of performance out of their rig with its 4-4-4-12 timings. At \$1,129 for a two-1GB DIMM pack, it'd want to be pretty special to justify the price.

You don't need to spend that much money to get ready for Vista though, and now that the enthusiast space is quite a lucrative market for memory manufacturers, the offerings from players like OCZ, Mushkin, and GeIL are all excellent potential choices. Most have products to suit varying budgets.



THE OFFERINGS FROM OCZ, MUSHKIN, AND GEIL ARE ALL EXCELLENT CHOICES — MOST WILL SUIT VARYING BUDGETS

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Part five

Windows Media Center

If you want to make the most out of Vista and your Media Center experience, you'll be needing a TV tuner. *Nathan Davis* explains the situation.

Windows Media Center (WMC) is only offered in Vista Home Premium and Vista Ultimate editions. Due to the simplistic nature of WMC, the requirements to unlock its full potential aren't all that high. If you have yourself a TV tuner working on Vista, you're most of the way there.

In terms of supported features, you'll find all the usual, such as time-jumping, pausing and recording live TV. Others include browsing pictures, listening to music and watching movies, locally or on the network. You can also burn your media directly to CD/DVD.

There are also features it's supposed to support, but which aren't available in Australia. These include downloading a list of available transmitted frequencies in your postcode region and a television program guide that can be linked to scheduled recordings. Nonetheless, if you're going to maximise WMC, you'll want a TV tuner.

ENTRY-LEVEL TUNER — AVERMEDIA DVB-T
TV tuners aren't renowned for their ease of installation; however, this basic PCI digital tuner has to be one of the easiest.

Vista detected the card, found drivers online, installed them, and voila! All done. Pop open Windows Media Center and it's ready to slurp down some digital telly.

Even as an affordable, entry-level digital tuner, this card doesn't skimp on features, including a bundle of inputs with RCA plugs for composite video and stereo audio, and an S-Video input, and it also comes with an infra-red remote control. Unfortunately, we found the included remote limited in its overall use, as it only fully works under AVerMedia's tuner application, which must be installed from the supplied CD. It can be used as a very slow, eight-directional mouse, but this proves quite tedious.

If you're happy to watch the one channel while recording, this basic card is an inexpensive and easy way to bring the digital TV signal to your Vista media box.

INSIDE INFO

● AVERMEDIA DVB-T A777

Contact: Altech Computers
Phone: (02) 8831 9999
Web: www.altech.com.au

HIGH-END TUNER — FUSION HDTV DVB-T

A digital dual-tuner card, this is a great example of a typical high-end, solid tuner. The benefits over a standard single-tuner unit are the ability to watch

or record two channels at the same time — or one of each. Unfortunately, you may wish to install the card's packaged software, as Vista's WMC doesn't support any form of picture-in-picture screening.

Don't let WMC's shortcomings suck wind from this card, though, as it's among the best available. It can completely max-out WMC's abilities, easily recording two channels while watching a DVD.

It wasn't as easy to install as the previous tuner, as we had to direct Vista to the temporary installation directory for the drivers, but this is a typical growing pain for a young OS.

Boxed with a Media Center-ready IR remote, it has all the necessary buttons to control the program. It can also power on and off your machine, thanks to an included pass-through power cable.

If you're after the most feature-filled experience, to Vista's WMC this tuner is a Swiss Army knife.

INSIDE INFO

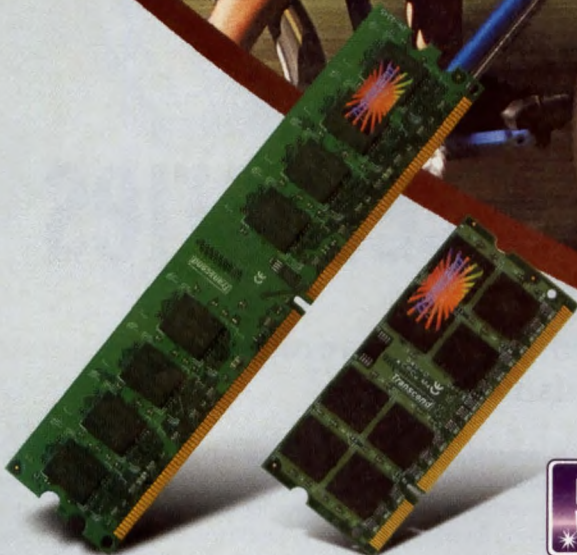
● FUSION HDTV DVB-T DUAL DIGITAL 2

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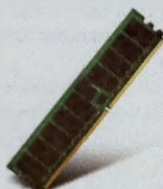
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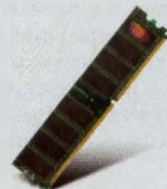
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Part six Vista hardware accessories

Two of the new features of Vista are ReadyBoost and voice recognition. *Dan Chiappini* takes a look at the options available.

Windows Vista is really going to change the way we compute, especially on a hardware level. Its system requirements are certainly not as taxing as was first rumoured all those months ago — even users with older machines upgrading to Vista will see performance gains. Currently, your machine is limited by its installed RAM, meaning that, in some cases, adding more isn't physically possible. Cheaper machines often only have two DIMM sockets for memory; once they're filled — short of replacing the existing memory with larger, more expensive modules — there's no room for expansion.

Vista will include a new feature called ReadyBoost, which is enabled by plugging in a USB flash drive 256MB or larger with at least 64MB free. In essence, it bypasses the hard drive's slower seek times to provide faster virtual memory, and is a great cheap expansion option for older computers that need a little extra go.

Rather than simply moving the page file to the flash memory, it creates a backup on the

device, taking up the amount of storage you allocate when you plug it in. Information is then sourced from the key, rather than needing to search the hard drive. Simply removing the USB key returns your system to the performance level it had before the flash insertion.

SELECTING A USB KEY FOR READYBOOST

There are a few requirements in order for the USB flash device to be supported, so you can't just stick in any old USB 1.0 drive you have kicking around and expect it to turn your PC into something godly.

The USB key must have at least 2.5MB/s 4KB random and 1.75MB/s 512KB random-write performance to be eligible. Many devices quote sequential instead of random-write speeds, so it's worth checking the manufacturer's web site before purchasing.

A quick search on the web reveals a few lists of compatible models for use with ReadyBoost, with a few major flash vendors announcing

products specifically designed for use with ReadyBoost. Transcend is one such company and has recently launched its JetFlash 150 and 180 products to coincide with Vista's launch.

A quick straw poll of the memory keys in the APC Labs found most ineligible — because they didn't make the speed requirements — but we were able to get it working with a first-generation Apple iPod shuffle. At launch, Vista will only support a single ReadyBoost per machine, and only up to 4GB, so dash any sneaky ideas you were having of buying multi-gigabyte USB flash drives instead of DDR2 for a shoestring PC upgrade.

READYDRIVE

ReadyDrive is a feature that will be implemented in Vista, but one that we may not see come to light straight away (as we're at the mercy of hard drive manufacturers). Similar in nature to the new-generation hybrid cars, these are a combination of a traditional hard disk drive with flash memory built in. The advantages of these drives are the speed at which information can be written to and retrieved from the flash, as disks don't need to spin up — and as a result, drives need replacing less often (and there are huge power savings to be had by not needing



SIMILAR IN NATURE TO NEW-GEN HYBRID CARS, READYDRIVE COMBINES TRADITIONAL HARD DISKS WITH FLASH MEMORY

Logitech Premium Stereo Headset:
 talk to Vista while listening to
 music and playing games.

to power and move a mechanical part). Since a large portion of day-to-day applications can be stored in flash, notebook users would have their time between charges considerably reduced. Desktop users will also benefit from the technology, with the non-volatile memory (NVRAM) providing faster boot times, less delay when restoring from hibernation and an overall performance increase for I/O and memory-intensive applications.

Intel's upcoming fourth-generation Centrino product codenamed Santa Rosa is said to include Robson technology — a NAND flash memory concept for mobile devices that dramatically improves cold boot time and battery performance by moving hibernation data and frequently accessed applications to flash rather than system memory (reducing power consumption).

Could these technologies finally bring in the all-day notebook battery? Here's hoping so.

VOICE RECOGNITION BUILT INTO VISTA

Despite computers themselves being hunking metal boxes designed to hold the prized hardware within, their uses make them inherently social devices. Email, VoIP, blogging and online gaming are interactive, so why shouldn't your alone time with your PC be as much fun?

Windows Vista will include a fully featured voice recognition system, designed to enable users to talk to their PC and have it operate accordingly. Traditionally, only applications such as Word document creation were possible by voice, but Vista opens the door to whole PC-controlled features such as launching applications, dictating, and performing functions traditionally only available with a keyboard or mouse.

The Vista voice recognition tools are also a liberating way for people with physical disabilities to be in full control of their PC without the confines of needing to input on a physical peripheral.

Multiple languages are supported out of the box, regardless of which Vista version you pick; all you'll need to get up and running is a basic microphone and some time to train the system to recognise your voice.

The real test is going to be seeing how it handles the Aussie lingo and whether it cracks a sad at the mention of eskies, stubbies and Toranas.

BUDGET VOICE HEADSETS — LOGITECH PREMIUM STEREO HEADSET

So you've got your Vista PC running and you want to have a go at talking to it. You're going to need a microphone for recording and headphones or speakers to listen to playback. Microsoft recommends a headset mic, as they tend to suffer less at the hands of ambient noise (since they're generally located close to your mouth). You're going to need to hear your playback, so why not get it through the thing already on your head?

Logitech's Premium Stereo Headset will serve you well as both a basic headset for listening to music and a way to get speech onto your PC — to take advantage of the new features. Its noise-cancelling microphone is perfect for dictation, instant messaging and VoIP, and its price certainly won't break the bank.

PREMIUM VOICE HEADSETS — PLANTRONICS AUDIO 360 MULTI-PERFORMANCE HEADSET

Basic is fine for first-timers and those who infrequently use speech-to-text software, but if you're using it all-day everyday, you're going to want to pick up a comfortable headset.

If anyone knows headphone design for communications it's Plantronics, the guys responsible for those immortal words during the moon landing in 1969. Neil's a big-shot astronaut: he wouldn't put up with crap gear.

The Audio 360 Multi-Performance Headset features a telescopic and bendable microphone,

putting it in reach of everyone's mouth. In-line muting lets you turn off your microphone before you sneeze — while verbally jotting down that million-dollar idea into Word. The ideal headset for VoIP, gaming, dictation and telling your PC to kill Flanders (or simply launching your web browser) is not cheap, but for those who take their business and entertainment seriously, these phones are worth dishing out for.

INSIDE INFO

● LOGITECH PREMIUM STEREO HEADSET

Contact: Logitech
 Phone: (02) 9479 0800
 Web: www.logitech.com

INSIDE INFO

● PLANTRONICS AUDIO 360 MULTI-PERFORMANCE HEADSET

Contact: Plantronics
 Phone: 1800 793 150
 Web: www.plantronics.com.au

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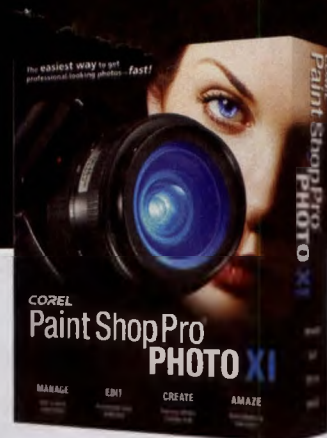
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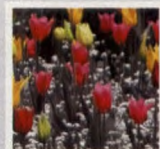
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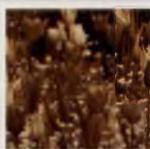
Photography software that lets you be both

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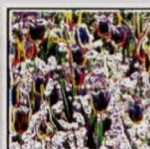
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HARD DISK DRIVE

● WESTERN DIGITAL RAPTOR X

Forget your sissy 7,200rpm drives: this badboy churns data at 10,000rpm and makes it ideal as a gaming or high-performance drive. It's only 150GB, but for running your OS, there's nothing better. Consider a switch to ReadyDrive disks as they become available.

RAM

● CORSAIR XMS2 DOMINATOR

If price is no object and best-of-breed is the order of the day for your PC, look no further. It's huge, unwieldy-looking and packed to the absolute gills with performance for your new Vista experience.

Part seven

The Ideal Vista PC

OUR COMPONENT PICKS

CPU

● INTEL QUAD EXTREME

When it comes to all-out performance, it's hard to top the only multicore consumer part on the market. With two Core 2 Duos stuck together, you know it's going to eat up Vista and anything you can throw at it.

MOTHERBOARD

● EVGA NVIDIA 680I

Overclocking nirvana for the habitual tinkerer, if you're going to splash out on a CPU of this calibre, go the extra mile and really give it a workout with this board.

TV TUNER

● FUSION HDTV DVB-T DUAL DIGITAL 2

Watch and record two HD channels at once, or record two while watching a DVD. Be entertained when it suits you, not the broadcasters.

GRAPHICS CARD

● NVIDIA GEFORCE 8800 GTX

If you're going the whole hog, why not chuck in a DirectX 10-ready graphics card while you're at it? The fastest product available today, it eats games at max settings and will help future-proof you when all those DX10 games start to trickle in before the flood.



Getting the Vista installation right

Part eight

Upgrading over XP

The easiest way to install Vista is to upgrade over your existing XP install — but you can't just upgrade from XP to any version of Vista. *James Bannan* explains why.

Windows Vista comes with a highly sophisticated upgrade installation process. Unlike the previous upgrade process in Windows XP, using Vista's upgrade install method actually performs a clean install of Vista, first collecting all the user settings, files and applications from the existing version of Windows and then restoring them on the new OS.

Previously, doing a similar clean system migration using XP would have meant saving data to an external source or non-system partition, but Vista manages the entire upgrade process without needing to do this. It's made possible by Vista's new file-based image technology, WIM (Windows Imaging Format). Since it's file-based and not sector-based, Vista can make use of existing hard drive space without needing to overwrite the existing system partition.

However, Vista comes in a number of different iterations which are configured for particular system environments, and a result of this is that you can't simply upgrade from XP to just any version of Vista. If you want to upgrade from some versions of XP, your only choice will be a clean install of Vista.

Windows XP Home users can upgrade to any version of Vista — the only users who can do so. XP Home is used as a platform for a wide variety of environments from gaming and family machines to home business systems, so it makes sense to leave the upgrade path open.

Windows XP Professional and Windows XP Tablet PC both feature heavily in the workplace,

upgrade options are available. A system running Windows XP Professional can still have Vista Home Basic installed, but the install method has to be a clean (from scratch) installation.

PREPARING TO UPGRADE

To test the upgrade installation, we put together a personalised Windows XP-based system



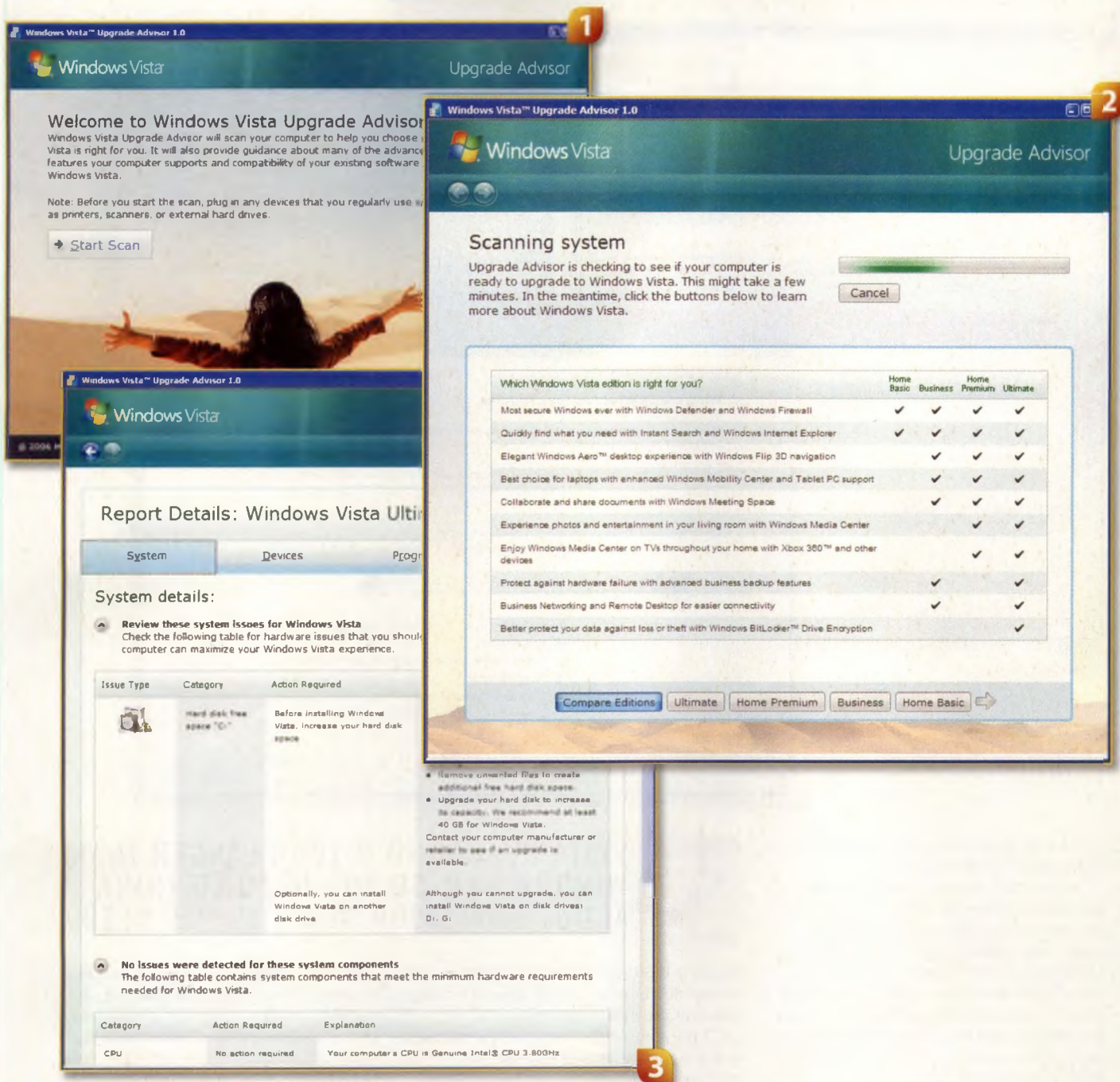
TO SIMULATE A SYSTEM READY TO BE UPGRADED TO VISTA, WE INSTALLED A NUMBER OF STANDARD USER APPS

so the upgrade-from-XP path is limited to Vista Business/Enterprise and Ultimate.

Systems running XP Media Center can only upgrade to Vista Home Premium or Ultimate, which are the only versions of Vista to feature the Media Center application. Finally, systems running Windows XP Professional x64 or Windows 2000 cannot be upgraded (clean installs will be needed there).

Bear in mind that these upgrade paths have nothing to do with licensing, but dictate which

with a number of pre-installed applications. To simulate a system ready to be upgraded to Vista, we installed a number of user applications like Microsoft Office, Firefox and a swag of smaller apps like Adobe Flash Player, Acrobat Reader and Sun Java. All the apps had some sort of personalisation — Firefox add-ins, custom homepage, modified templates — and Windows itself used a personalised, password-protected user account. The idea behind this was to examine the upgrade process and see



what precisely gets migrated across to Vista — traditionally, upgrading from one operating system to another has been a hit-and-miss affair, especially when applications are concerned.

① Although the upgrade process is straightforward enough, there are some critical tasks to do in preparation. First, install the Windows Vista Upgrade Advisor (and MSXML 6.0, which is a pre-requisite).

This application is available on Microsoft's web site. It scans your entire system, examining hardware devices, system requirements and applications, and produces a detailed report about its readiness for Windows Vista (see our

Upgrading Your Hardware guide on page 51 for more on this).

If you've already made the decision to install Vista, you probably don't care too much about the Advisor's opinion on the subject, but it does provide a very useful service in that it will examine all the installed hardware drivers and check them for compatibility with Vista.

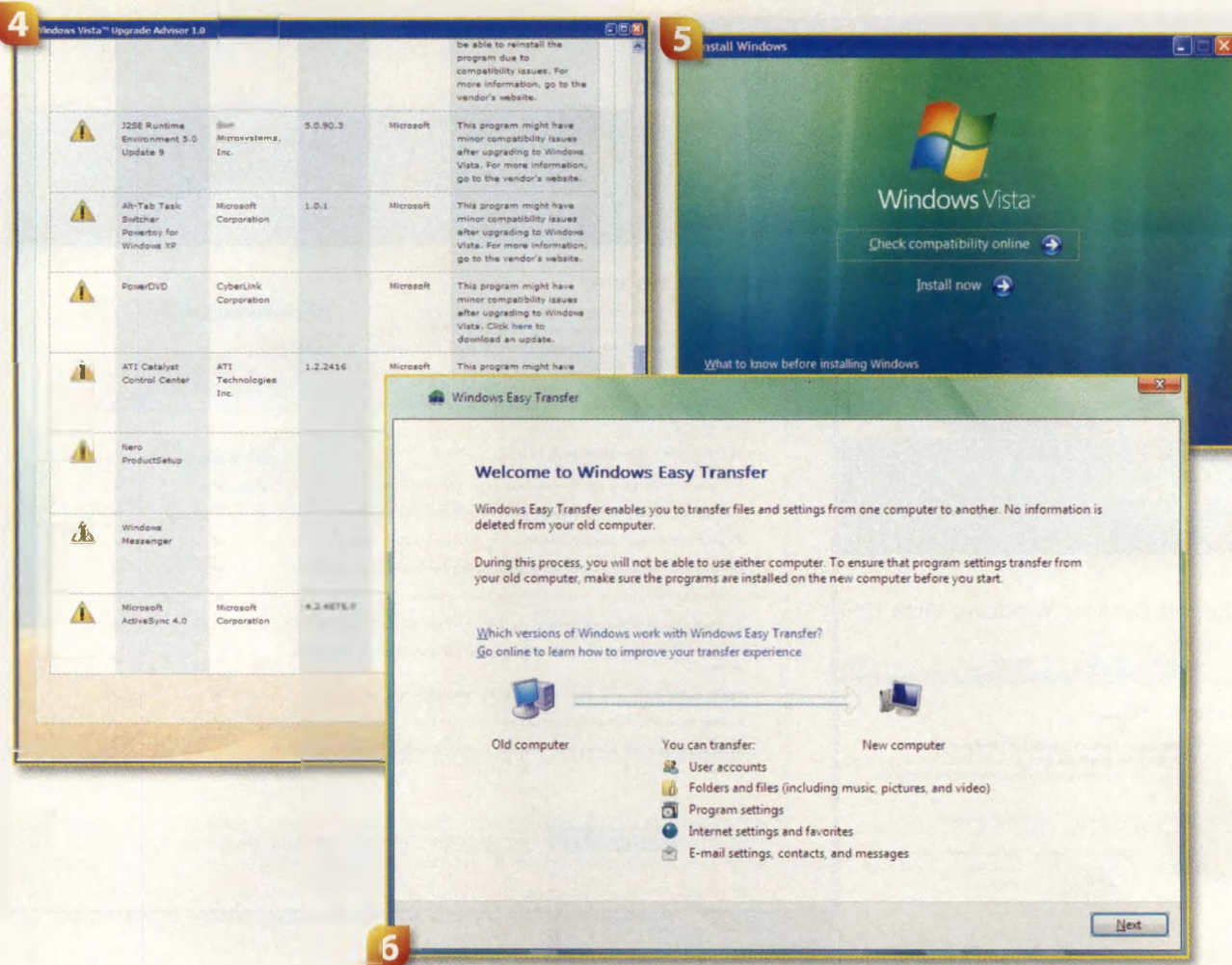
This helps greatly in identifying hardware which may not be supported out of the box. Vista's driver base is excellent but, at the time of release, several hardware manufacturers like Creative had not produced any final release drivers, and considering that Vista doesn't

include any beta drivers, upgrading without checking whether all the components are fully supported can result in a Vista system with reduced functionality.

Before running the Upgrade Advisor, plug in all the peripherals you would normally use with your system — the Advisor will scan these as well.

② The scan report recommends a version of Vista based on your existing setup. The report gives a detailed breakdown of what devices you have installed and whether or not Vista will support them. This is just based on whether there is a compatible driver in Vista's driver database — if a supporting driver can't be

Vista upgrade superguide



found, that doesn't necessarily mean that the hardware won't run under Vista.

Instead, the Advisor lists which devices encountered problems and directs you to the vendor's web site. Bear in mind that many drivers are actually bundled with control applications, like ATI Catalyst Control Center. Even if hardware is natively supported in Vista it won't incorporate these extra utilities — just the base driver. So it's still worthwhile going to each vendor's web site and downloading the official Vista driver.

9 The Advisor also scans the system for available hard drive space, CPU, RAM, DVD and video card capabilities. The depth of the scan actually depends on which version of Vista you're checking the system against. For example, if you select Vista Business, the Advisor won't check whether the computer has a DVD burner, as Vista Business doesn't have the DVD Maker application. Change the selection to Vista Home Premium which does have DVD Maker, and the check is made. In terms of space requirements, the Windows partition which is being upgraded needs at least 15GB free. Vista is



VISTA IS AROUND 8-10GB LARGER THAN WINDOWS XP, SO YOU NEED TO THINK ABOUT HOW MUCH SPACE YOU'LL NEED

around 8-10GB larger than Windows XP, so you need to do a bit of calculation as to how much space will be left after the upgrade.

10 The program check scans all the currently installed applications and flags any which might have problems. The recommendations depend on the problem. For example, earlier versions of Nero have compatibility issues with Vista, but the Advisor suggests that it should be uninstalled first and reinstalled after the upgrade. And even then it warns that compatibility issues exist and that the program may not work as expected. Other applications which have less serious compatibility issues simply carry caveats that they may not work as expected under Vista (in other words, you have been warned), and some of them, like Cyberlink Power2DVD, have links to the latest online patches.

It's well worth going through the list and checking out each vendor's web site — you can find out some interesting information. For example, Microsoft ActiveSync is flagged as a potential problem, but the ActiveSync web page details how Windows Vista has scrapped ActiveSync in favour of the Windows Mobile Device Center. So, uninstall ActiveSync before the upgrade and prevent a potential problem.

As a final note — back everything up. Although Vista's ability to upgrade is extremely good, for every thousand upgrades that go well there will be at least one that won't. If that one is you, don't get caught without a complete system backup. There are some terrific tools on the cover DVD which will assist you in taking an image backup of your computer. Have a read of our online install guide: www.apcmag.com/install for backup advice.

Choose how to transfer files and settings to your new computer



Use an Easy Transfer Cable (recommended)

Make sure that you can plug the cable into both computers at the same time.



Transfer directly, using a network connection

Both computers must be connected to the same network.



Use a CD, DVD, or other removable media

You can use a USB flash drive, external hard disk, or a writable or rewritable DVD.

[Help me decide](#)

Choose a network location

To help protect your files and settings during the transfer process, you can create a password for the location where the files are stored. Make sure that you write down or save the password because you'll need to use it on the other computer.

Network location:

Z:\Backup\SaveData.MIG

[Browse...](#)

Create password (recommended):

[Confirm password:](#)

What do you want to transfer to your new computer?

After you choose an option, you can choose how to save the information on your new computer.



All user accounts, files, and settings

(Recommended)



My user account, files, and settings only

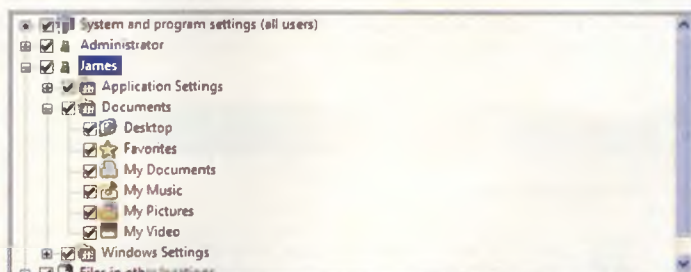


Advanced options

[Help me decide](#)

Select user accounts, files, and settings to transfer

To transfer files from locations other than shared folders or the Documents folder for each user, click Files in other locations, and then select each location that you want to transfer. Windows will transfer data files in the locations you select.



Transfer size: 5.31 GB

[Add files](#) [Add folders](#)
[Select drives](#) [Exclude folders](#)

START THE UPGRADE

The Upgrade can only be performed from within Windows, so don't boot the machine off the Vista DVD. Instead, fire up Windows and load the DVD.

1 The autorun window is displayed, giving you four options:

- Check compatibility online
- Install now
- What to know before installing Windows
- Transfer files and settings from another computer

Check compatibility online links to the Windows Upgrade Advisor.

What to know before installing

Windows opens a help file which runs through some of the tips and tricks available for ensuring that this all goes smoothly, based on a few installation scenarios. It's worth a read for peace of mind.

Transfer files and settings from another computer launches the Windows Easy Transfer application, which you can use to perform a backup of user files and settings.

So, is this step necessary?

The upgrade process will do this for you but, just in case, it's worthwhile to have a backup stored somewhere else.

BACKUP PRECAUTION

2 Fire up the (Windows Easy Transfer) Wizard and click Next. 3 As you can see from the transfer options offered, Easy Transfer is actually designed to transfer files and settings from an old computer to the new one, when the new computer is a completely separate machine.

However, the "CD, DVD or other removable media" option effectively makes a backup to be referenced later, rather than a straight transfer.

On the next screen, click "External hard drive or to a network location". By default, the save location is the local C: drive, which is not so practical. Click Browse and connect to either an external hard drive or USB key (make sure there's plenty of room) or to a network drive. 4 If you don't have a drive mapped to a network location, you can browse directly using My Network Places, or right-click on My Network Places and select Map Network Drive. The default file type is MIG and you can password-protect it if you're feeling especially paranoid.

5 Hit Next, and then there's the option of what exactly you want to transfer. The recommended option is to transfer "All user accounts, files and settings". This is only really necessary because Windows sometimes stores application data and shortcuts in the All Users or Default Users profile instead of your personal profile, and if you just back up the logged-on user profile the transfer might miss something.

6 For total control over what gets backed up, click "Advanced Options". Here you can choose pretty much any aspect of the system to back up — individual user accounts, application settings for any application, Windows settings and non-system folders (eg. not C:\Program Files or C:\Windows). Make all the selections you're after and hit Next: the wizard collects all the files/folders specified and starts the transfer.

Once that's complete, the wizard closes and you're back to the DVD menu, with a backup file stored away from the main computer. The whole process isn't strictly necessary, given that Vista will perform exactly the same process during

Vista upgrade superguide



the upgrade, but it does buy peace of mind (and you can always erase the backup once the upgrade goes through).

START THE INSTALL

① When you're ready to go, click on "Install Now". The Vista install launches, and you'll be prompted to choose whether you want to go online to get installation updates.

This is a useful feature of the upgrade install as Vista is essentially running as an application on top of Windows XP, so it can leverage XP's internet connection to connect back to Microsoft and grab install files, security updates and hardware drivers. If you have an active connection to the internet, this is a highly recommended option to tick. Once you do choose it though, the machine mustn't be disconnected from the internet for the remainder of the install process.

IMPORTANT: if your broadband connection relies on authentication software installed on the system, don't choose this option. Vista will restart during the install and there's no guarantee that the machine will reconnect to your ISP.

② Next, Vista will prompt for the product key. You don't have to enter the product key

at this stage — Vista will work fine for 30 days without a key. The advantage with this process is that you can try any version of Vista available on the DVD for a month, before being forced to activate. However, if you're installing a different version of Vista to the one which you purchased, you will have to re-install from scratch once the 30 days are up. For example, you can't purchase Vista Home Premium, install Vista Ultimate and then enter the Home Premium product key after 30 days. The key will be the wrong type and won't be accepted.

At the end of 30 days, Vista enters Reduced Functionality Mode (RFM). Windows will load to the log-on screen and request a product key and activation — and will go no further.

It is recommended that you enter the key though and tick "Automatically activate Windows when I'm online". Windows determines which version of Vista to install based on the product key — if you don't enter one, you'll have to specify which Vista you purchased.

Next is the EULA, which must be accepted for the install to proceed.

③ The next screen offers two types of installation — Upgrade or Custom. Custom is only really used for clean installs, so ignore

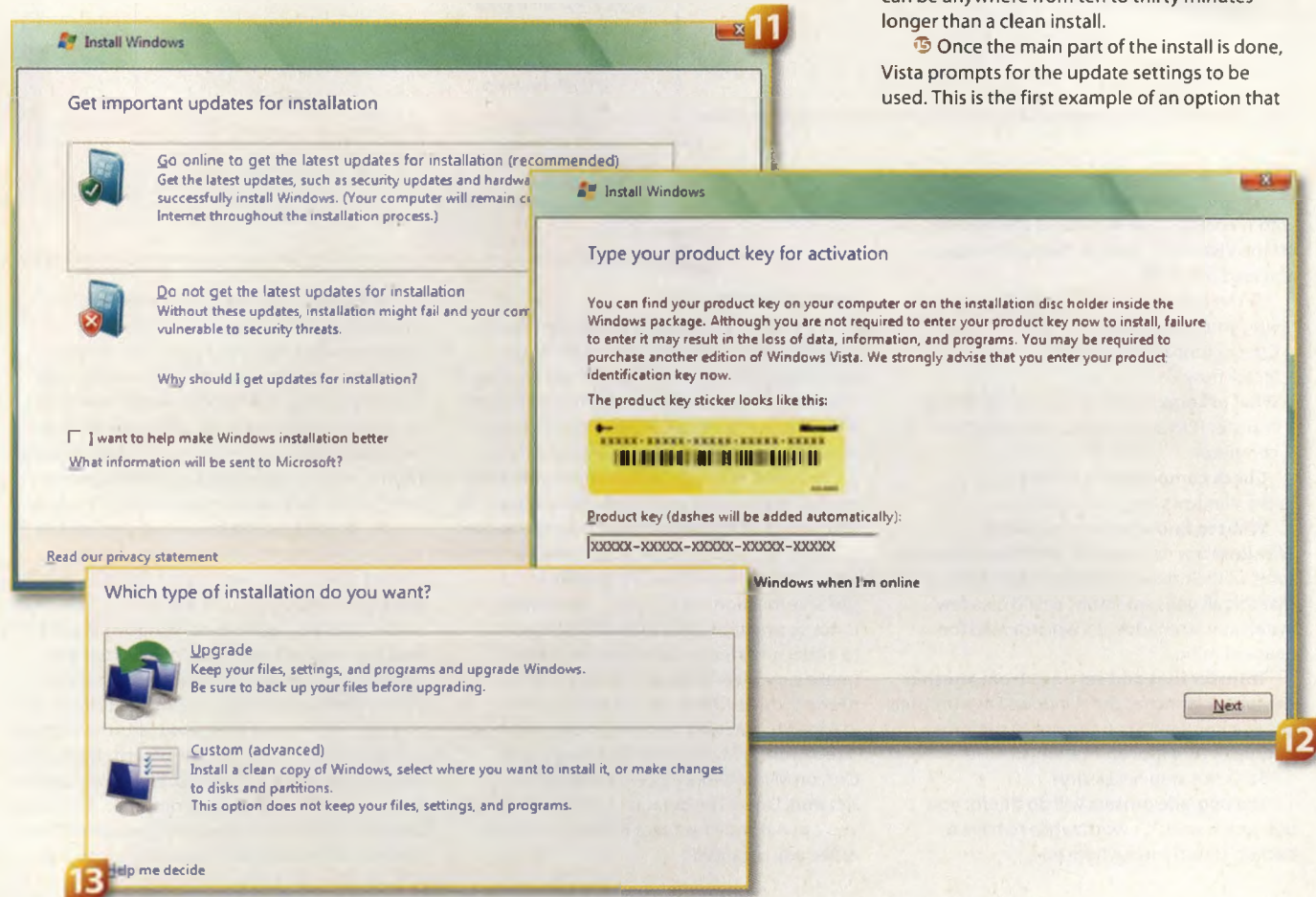
that option. The description of the Upgrade option is that it will keep your files, settings and programs, but that you should back up your files first. Bit of a last-minute warning, but it's not too late. Click the red cross and you can back out of the install and back up those files you suddenly realised you can't live without.

④ Proving that paranoia is alive and well, Vista will run another very quick compatibility check and display the warnings (if any).

In our test case, it warned against Windows Messenger 5.1 and Sun Java Scheduler potentially not working as expected in Vista. If you're not concerned with the warnings, hit Next and know that there's no turning back.

Actually, that's not entirely true. You can back out of the installation at any stage up to the physical installation. Click on the red cross and the install procedure will check whether you want to stop. This is a useful feature afforded by Windows Preinstall Environment 2.0 and the new WIM format. The file copy, expansion and installation processes take about the same length of time as a clean install of Vista, but the overall time is blown out by the upgrade process. Depending on how much you have installed, and especially how much information is stored under your user profile, the installation can be anywhere from ten to thirty minutes longer than a clean install.

⑤ Once the main part of the install is done, Vista prompts for the update settings to be used. This is the first example of an option that



14

! Potential issues were detected with installed applications/devices

These issues do not prevent your upgrade, but some applications and/or devices might not work once your upgrade completes.

- o Sun Java Scheduler
- o Windows Messenger 5.1

15

Help protect Windows automatically



Use recommended settings

Install important and recommended updates, help make Internet browsing safer, and check online for solutions to problems.



Install important updates only

Only install security updates and other important updates for Windows.



Ask me later

Until you decide, your computer might be vulnerable to security threats.

[Learn more about each option](#)

When you use recommended settings or install updates only, some information is sent to Microsoft. The information is not used to identify you or contact you. [Read our privacy statement](#)

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Select your computer's current location

Windows has detected that this computer is connected to a network. You can choose to apply the correct network settings for the location.



Home

Choose this for a home or similar location. Your computer is discoverable and you can see other computers and devices.



Work

Choose this for a workplace or similar location. Your computer is discoverable and you can see other computers and devices.



Public location

Choose this for airports, coffee shops, and other public places or if you are directly connected to the Internet. Discovery of other computers and devices is limited.

If you aren't sure, select Public location.

was set in XP which hasn't carried across (our workstation was obtaining automatic updates via Windows Server Update Services). Click "Use recommended settings". Date and Time should pick up properly from the system clock. Choose what sort of network you're connecting to, and that's it for the install.

A SUCCESSFUL MIGRATION?

So, how did this migration actually go?

The first thing to notice is that Vista's upgrade install does not ask you to assign the computer name, user account and desktop background. Impressively, all this information comes across from XP. My user account was recreated properly and even had the password reassigned without my having to enter it again. The desktop wallpaper was correct, contents of My Documents, Pictures, Music and Videos had been moved across into their new homes in the C:\Users\JBannan. Icons were correct, folder viewing preferences had been maintained and the Start Menu was configured the same way.

With the applications, Internet Explorer was already on version 7 before the upgrade.



MY USER ACCOUNT WAS RECREATED PROPERLY — THE PASSWORD REASSIGNED WITHOUT MY HAVING TO ENTER IT AGAIN

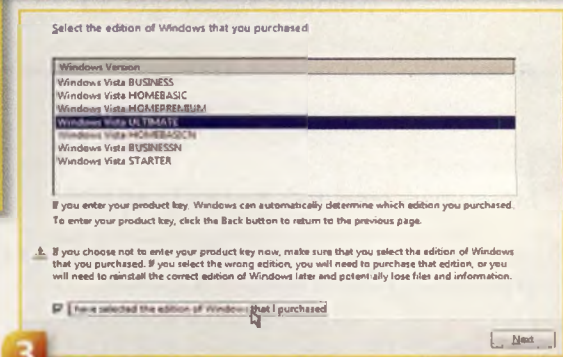
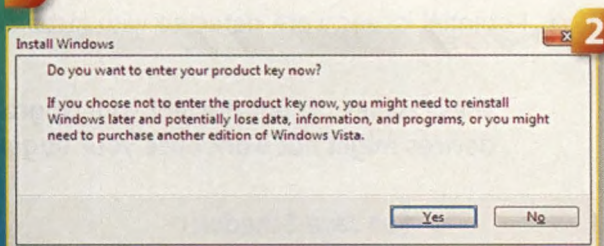
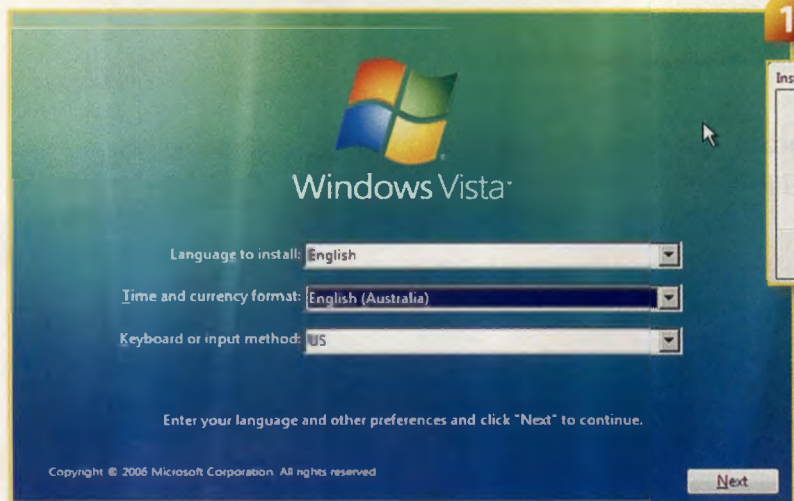
On Vista, the homepage settings and search providers came across, but those were the only customisations. Firefox loaded correctly and was still the default browser (Vista had not reset this). All the add-ons, extensions and preferences were intact. All of this information is stored in the Application Data folder under the user profile in Windows XP, and had been migrated properly across to the AppData\Local folder under the user profile in Vista. Indeed, a user's profile folder under C:\Documents and Settings in Windows XP contains pretty much everything to do with that user. The structure is kept pretty much intact in Vista under C:\Users.

This trend continued with the Microsoft Office apps. Every single customisation came across from each app — Word templates, Outlook accounts and PST files. Add-on applications like Sun Java, Adobe Reader,

Flash and Shockwave also came across with no complaints and worked perfectly first go — no reinstallation needed — and the list of installed programs looked exactly the same as the Add/Remove programs list in XP.

The only program which didn't migrate perfectly was VMWare Tools. It worked, but exhibited some slightly erratic behaviour and had to be reinstalled to fix. So, if you're testing Vista in a virtual environment, bear this in mind as a post-install task.

Overall, the migration was extremely impressive. Every personalised aspect of Windows XP and the installed apps were brought across and implemented correctly. If you run lots of applications and don't want to face the prospect of a clean Vista setup (and then reinstalling everything from scratch), upgrading is a great option for most users.



Part nine Vista — clean installs

Vista's install process is so streamlined that a clean install is almost fire-and-forget. However, there are always things to look out for, *James Bannan* explains.

To get Vista going, all you really need is a clean partition to install it on. We're assuming Vista will be the only bootable OS on your system and that the hard drive does not contain a pre-existing boot partition with another operating system (see our Dual-Booting guide if it does, page 74).

From a space perspective, Vista Ultimate takes up just under 10GB, but you'll want at least 20GB for smooth operation (not taking additional applications into consideration, of course).

Load up the Vista DVD and allow it to boot. It will load into active memory and launch Windows PE 2.0 into a virtual drive mapped as X:.

1 The first screen is Regional Options — default Language (you can install more later on), Time and Currency format and Keyboard format. Click Next and then you will have the choice to Install Now, read some installation tips or Repair.

The Repair feature will detect and repair an existing Windows Vista installation which has failed — this is a useful feature for any future disaster recovery.

2 Once you hit Install Now, Vista will prompt for the product key. Unlike Windows XP, you don't actually have to enter the product key at this point in time. Vista will function for 30 days without a key, after which you have to enter a key and activate Windows. The advantage with this process is that you can try any version of Vista available on the DVD for a month, before being forced to activate. However, if you're installing a different version of Vista to the one which you purchased, you will have to re-install from scratch once the 30 days are up. For example, you can't purchase Vista Home Premium, install Vista Ultimate and then enter the Home Premium product key after 30 days. The key will be the wrong type and won't be accepted.

At the end of 30 days, Vista enters Reduced Functionality Mode (RFM). Windows will load to the log-on screen and request a product key and activation — and will go no further.

Automatic activation is ticked by default — if you're entering the product key at this stage, leave it ticked. Otherwise Vista won't attempt to activate for 30 days, regardless of whether a product key is entered or not.

3 If you don't enter a product key, then the next screen will ask which version of Vista was purchased. This links the back-end to a scripted install contained within the INSTALL.WIM file on the DVD, which specifies which Vista components are to be installed, based on the selection.

The next screen is the EULA, which must be accepted.

4 The screen after this is the installation type — note that an upgrade installation has to be launched from within Windows, so Custom Install is the only available choice.

5 Next, you're given the option of where to install Vista. Depending on your system, you might not see an available hard drive and will need to load the appropriate storage drivers. Click on "Load Driver" and Vista will scan the system for available drivers to use. If it can't find any, you'll need to point Vista in the right direction. Luckily, because the install environment is PE 2.0, everything is plug and play, even at this early stage, and USB is supported, so you can extract the drivers to a USB key, hit Browse and navigate to the correct folder and select the appropriate drivers.



Installing Windows...

That's all the information we need right now. Your computer will restart several times during installation.

- ✓ Copying Windows files
- Expanding files (9%) .
- Installing features
- Installing updates
- Completing installation

Interestingly, you can even load other drivers (like chipset drivers) at this point, assuming they are newer than the ones which Vista will load. Vista stores them in memory and references them at the appropriate point in the install.

Once you've got the drive, you can either just click Next, in which case Vista will use the entire drive to install, or you can click "Drive options". This lets you create a new partition or format, delete or extend an existing one. This is useful if you're overwriting an existing partition (but still have data on other partitions on the same disk). Hit Next and the file copy process kicks off. Here's where you can walk away for twenty minutes or so... Vista has already gathered all the information it needs.

Once the main installation is done and the machine restarts, you're prompted to enter



YOU'LL WANT AT LEAST 20GB FOR SMOOTH OPERATION (NOT TAKING ADDITIONAL APPS INTO CONSIDERATION)

some personal information: 1 user name, password, picture, computer name and 2 desktop background. Automatic updates are also set at this stage. For a home/standalone machine, accept the recommended settings. However, if you're planning on configuring the workstation to update from WSUS, select "Ask me later". Next is time and date settings. Windows looks at the local system clock, so if that is correct you shouldn't have to change anything.

3 And that's it — you're done! Vista runs performance checks to determine your desktop: whether Aero is enabled, screen resolution etc. Since the early betas, Vista has demonstrated an excellent ability to generate a desktop that is almost, if not exactly, how the finished product will look. Think back to XP installs and how much customisation needed to be done when XP first loaded to get it looking decent. Those days are over: Vista manages to get a new system up and running with minimal effort.



WARNING

Back up data
before proceeding!

Part ten Dual-booting with XP

Want to keep your current XP install but still run Vista? The new OS offers a great chance to set up a dual-boot or multi-boot system. *James Bannan* explains how.

To explore Vista's dual-booting options, we set up a test Windows XP-based system running on a 40GB hard drive with a single partition taking up the entire drive. The dual-booting scenario covered here is dual-booting Vista with Windows XP. In the next section, we dual-boot Windows Vista with Linux.

PREPARING YOUR SYSTEM

One of the problems with dual-booting any system with Windows Vista is that Vista's boot manager automatically takes over from any other manager installed on the system. This isn't something you can change, and unfortunately it's not particularly flexible either. If you already have a dual- or multi-boot system in place, chances are that installing Vista will break it. You won't lose any data, but the other operating systems will fail to load properly.

The best scenario when dual-booting Vista is to be running a single instance of Windows 2000/XP and then install Vista alongside it. Alternatively, you can do a clean install of Vista first and add secondary OSs after that.

On our test machine, we start with Windows XP as the only installed operating system.

XP takes up the entire hard drive and therein lies the first problem. You need at least 15GB of available drive space to install Windows Vista. One option is to install another hard drive into the system and install Vista on that, but if you'd rather avoid the upfront expense then a better way is to create some free space on the drive.

This isn't simply a matter of erasing data from the main partition which holds your current XP installation — it's a question of creating a new partition with enough space to store Vista. To achieve this you'll certainly need enough overall hard drive space available, so this may require the deletion of some data (so the current XP partition can be shrunk enough for another partition to be created for Vista).

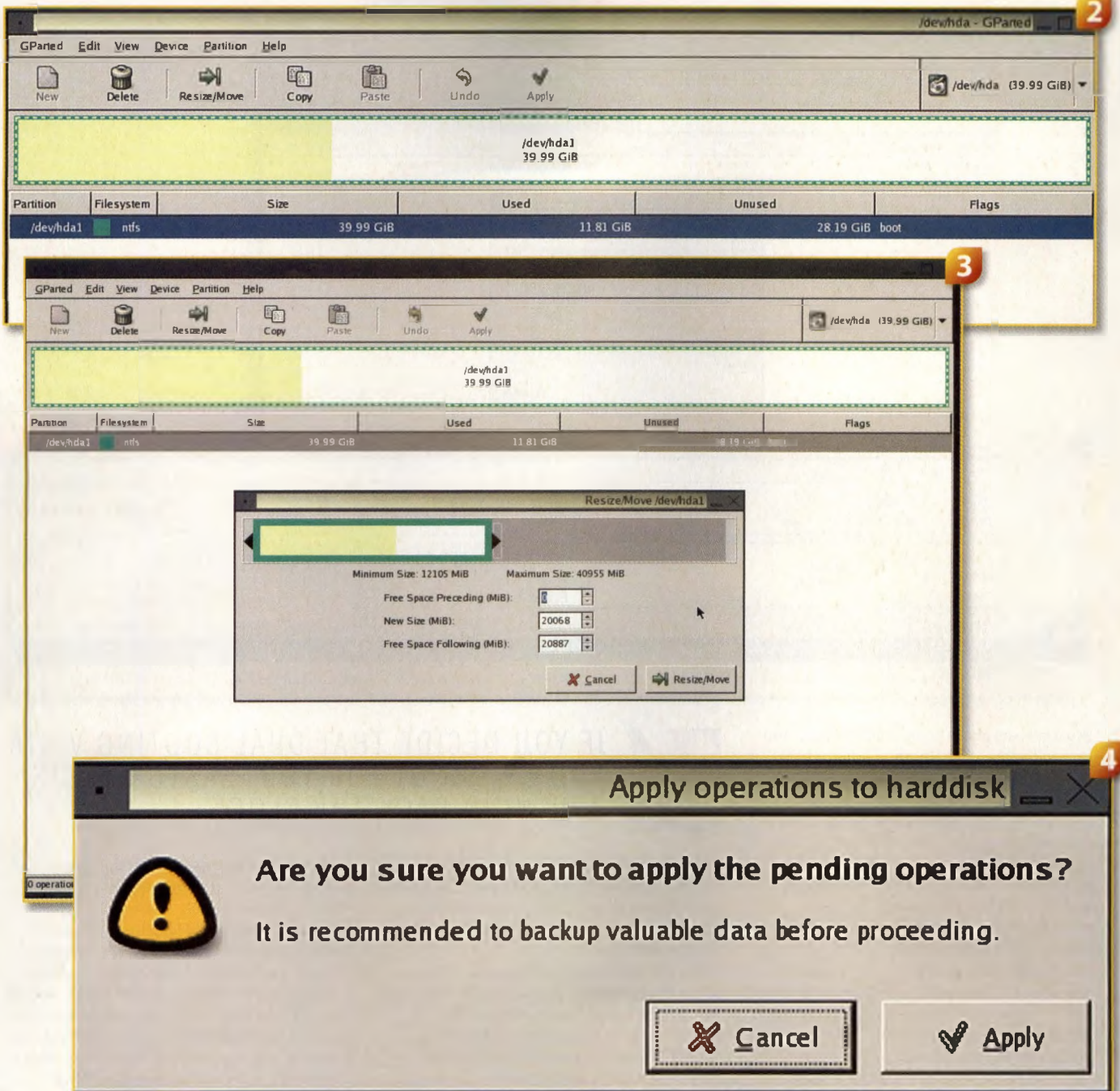
Partitions on a hard drive are quite flexible in that they can be resized or moved around without damaging the data they contain — they're essentially just logical containers, and the stated size of a partition doesn't directly relate to the amount of physical space it takes up on the disk. That is determined by data. For example, you can have a 200GB drive with an 80GB partition which only holds 20GB of actual data. That partition could easily be shrunk

without affecting the system at all, but the disk will register that it now has a lot more space to play with. That's what we need to do with the Windows XP partition.

PARTITIONING

Make sure you've got your data backed up, then begin the repartitioning. You can't modify a Windows XP system partition with the standard system tools, so we'll use a third-party application called GParted — the Gnome Partition Editor. Like Windows PE, it boots to a stripped-down operating system without touching the underlying system. The advantage with using GParted is that it supports FAT32 and NTFS partitions, so we can use it to shrink the existing partition to free up drive space for Vista. ❶ The GParted ISO is on the cover DVD — burn it to CD and boot the system from the CD.

Depending on your system, you shouldn't need to select any of the boot options. The only one which may be necessary is "Manual video card", just in case GParted can't detect the GPU properly. Continue to load the CD, choose the language, keyboard mappings and video driver



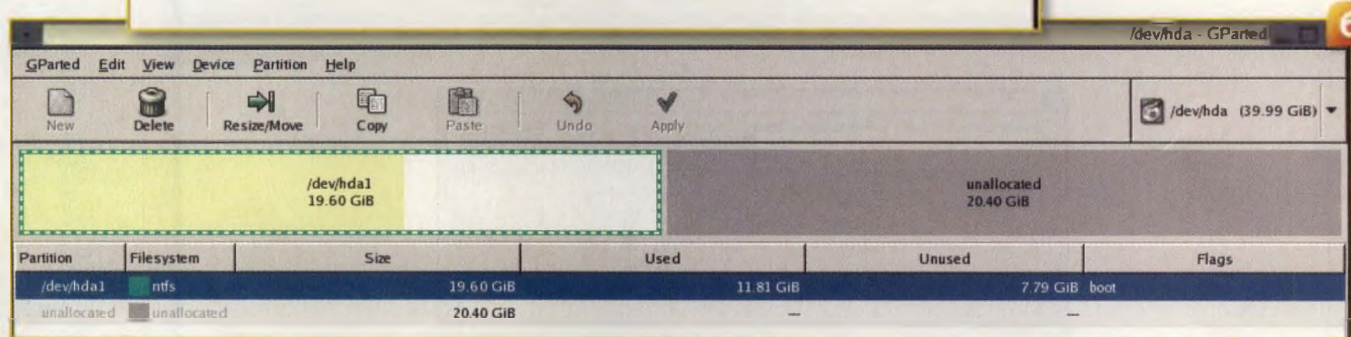
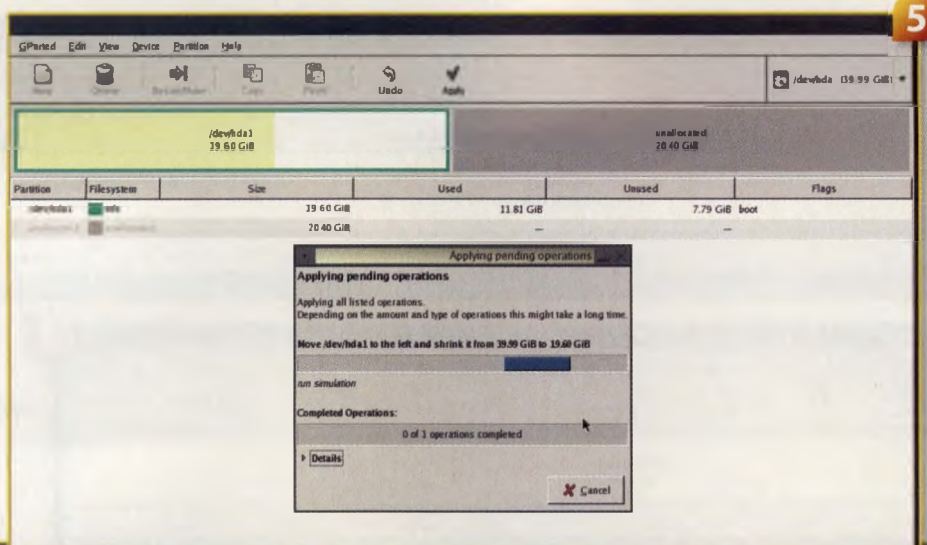
if need be, then colour depth and resolution. Once done, the main GParted GUI loads.

❷ The GUI presents you with a graphical representation of your physical disks and the partitions they contain, each outlined in green. ❸ Modifying a partition size couldn't be easier — right-click on the partition and select **Resize/Move**. Now hover the cursor over the right arrow and drag it to the left to shrink the partition. Use the boxes to manually change the values if you want a fine degree of control over the resizing, then click **Resize/Move** again.

❹ The GUI shows the updated changes and also a task box at the bottom of the screen. The changes haven't actually been made, they've just been scheduled to run. To commit the changes and resize the partition, click **Apply**. GParted will ask to confirm the changes: hit **OK** and away you go. ❺, ❻ And that's it — GParted is one of the best partitioning tools out there.

INSTALL VISTA

And now we're ready to get Vista installed. The installation is actually a clean install, and all the



usual caveats about compatibility apply. You should use the Vista Upgrade Advisor tool as if this was a standard clean install or upgrade.

Restart the system and boot from the Vista DVD. As this is not an upgrade install, select Custom install. Once the install gets to the install location, there should be at least two options — a partition marked as Primary and the unallocated space. Select the unallocated space and click Next. The install will then commence.

As mentioned previously, the Vista boot manager will take over the system completely, and Windows XP effectively loads via Vista. It's all pretty seamless though, and you shouldn't encounter any technical problems.

Once Vista is installed and the system reboots, you'll be presented with a boot menu with two options — "Microsoft Windows Vista" and "An Earlier Version of Windows". This is perhaps a little bit bland, so you'll probably want to change it. Here's where one of the new features of Vista comes in, and it's not so terrific. In Windows XP, if you want to modify the bootloader, just right-click on My Computer, select Properties, go to the Advanced Tab and click Settings under Startup and Recovery, then click Edit. This opens a local file — boot.ini. It's just a standard text file and you can change pretty much anything.



IF YOU DECIDE THAT DUAL-BOOTING VISTA AND XP IS NOT FOR YOU, EASYBCD LETS YOU WIND BACK THE CLOCK

Unfortunately, it's not that easy in Vista — you can still navigate to the Startup and Recovery settings, but all you can do is select which operating system is the default and modify the timeout settings.

To edit Vista's boot manager you have to use the command-line BCDEDIT utility. To access BCDEDIT, run the Command Window as an administrator and type in BCDEDIT. Unfortunately, BCDEDIT isn't an easy tool to come to terms with, especially as it's purely command-line driven. So, for the adventurous, a great tool to introduce here is EasyBCD by NeoSmart Technologies. EasyBCD offers a GUI front end to BCDEDIT, making life much easier.

Install EasyBCD and launch the application once it's done. To configure the bootloader, go to "Configure Boot" — you'll see the two entries for both XP and Vista, and to change the name of Windows XP, just overwrite "Earlier Version of Windows" with "Windows XP" and click Save Settings. Reboot the system and the changes are visible.

Open up Windows Explorer and there's two hard drives — the primary disk running Vista and the secondary disk with XP installed. Restart the system and load up Windows XP; the XP disk is now the primary, with the Vista partition running on the secondary D: drive.

If you decide that dual-booting Vista and XP is not for you, EasyBCD lets you wind back the clock. All you have to do is remove Vista's boot manager — go to "Manage Bootloader", select "Uninstall the Vista Bootloader" and then "Write MBR". Restart the machine and that's it — the XP boot loader is the only one left on the system and XP loads. You can then delete the Vista partition and use GParted to re-extend the partition to take up the entire disk.

EasyBCD has a load of great features for modifying Vista's boot manager, one of which is that you can add new boot entries (and one of these is Linux).

These instructions are available in more detailed screen-by-screen format if you are unsure of certain steps at www.apcmag.com/dualboot.



Part eleven

Dual-booting with Linux

Many tech enthusiasts will want to run both Vista and Linux on the same PC. *James Bannan* runs through the options on how to do it.

There are multiple ways of dual-booting Vista and Linux, and users generally choose the one that best suits their setup.

If you already have Linux installed on your machine, you have some work to do. All versions of Linux install their own bootloader, but if you install Vista alongside them, Vista will overwrite it and make your Linux inaccessible.

In this scenario, after installing Vista on a PC containing Linux, you then have to modify Vista's bootloader to connect to your pre-existing Linux. The simplest way is to use the EasyBCD utility to modify Vista's bootloader to connect to the previously-installed Linux. But at the time of writing, the version of EasyBCD available (1.5) only supports the GRUB bootloader (Linux distros use two types of bootloaders, GRUB and the universal LILO).

A slightly easier method of dual-booting Vista with Linux is to reformat the machine and install Vista first to a smaller partition, leaving plenty of free space for the Linux install. Then install Linux — the GRUB bootloader actually does a very good job of recognising that Vista is installed and will support it.

Below are the options in detail. They are also available online at apcmag.com/dualboot in longer screen-by-screen versions if you are unsure about any of the steps outlined below. You will also find feedback from other readers who have done this already.

Remember, playing with boot partitions is like flying a 747. Thousands of trained pilots do

We'll use a third-party application called GParted — the Gnome Partition Editor. It boots to a stripped-down operating system without touching the underlying system. The GParted ISO is on the cover DVD — burn it to CD and boot the system from the CD. GParted supports all Linux-based file systems. Boot the Linux machine on the GParted CD and shrink the



PLAYING WITH BOOT PARTITIONS IS LIKE FLYING A 747: THOUSANDS OF TRAINED PILOTS DO IT SAFELY EVERY DAY

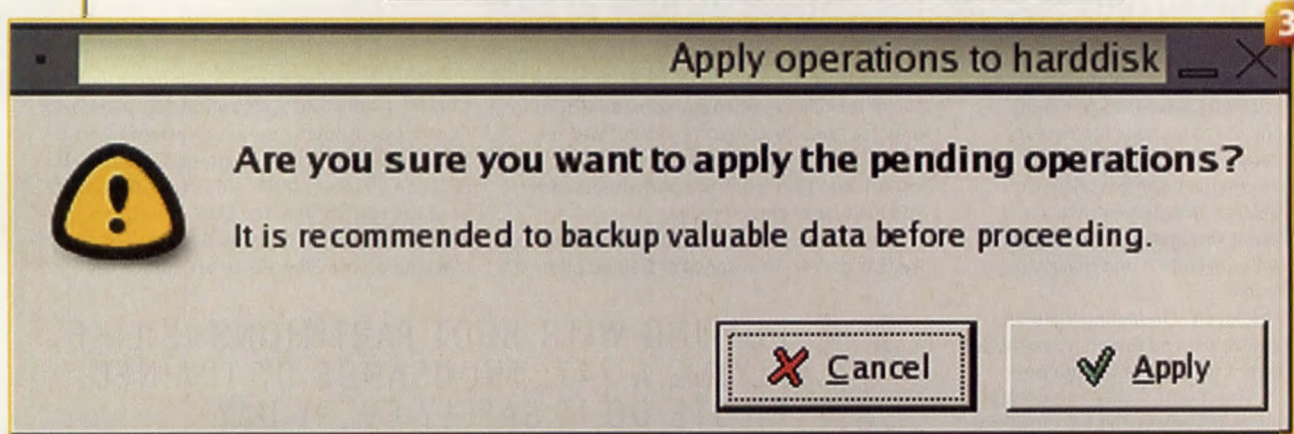
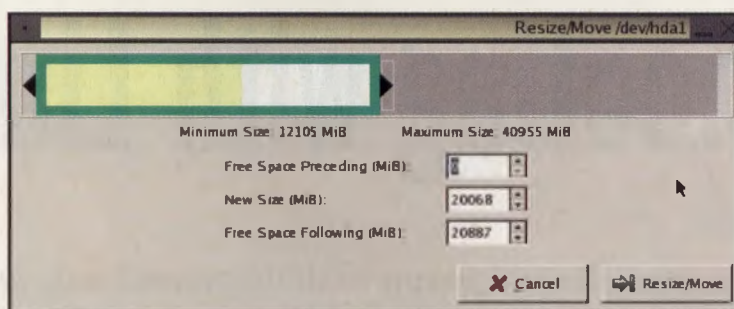
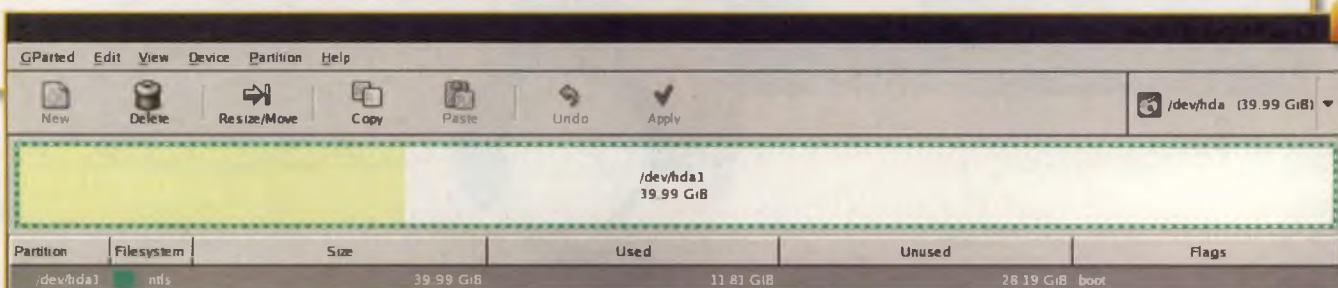
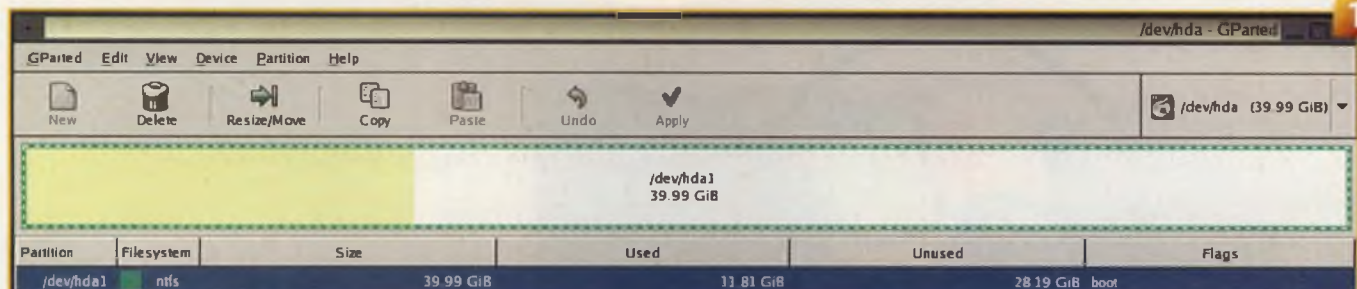
it safely every day — but should something go wrong, the results can be catastrophic. Please back up your partitions/data before proceeding.

OPTION 1 — LINUX ALREADY INSTALLED

Preparing a system which has Linux on it for an installation of Vista is similar to preparing an XP system. You first have to shrink the Linux partition to make way for Vista; the process for this stage is the same as that for dual-booting with XP (page 74).

main root partition (not the extended or swap partitions) to make space.

Depending on your system, you shouldn't need to select any of the boot options. The only one which may be necessary is "Manual video card", just in case GParted can't detect the GPU properly. Continue to load the CD, choose the language, keyboard mappings and video driver if need be, then colour depth and resolution. Once done, the main GParted GUI loads.



1 The GUI presents you with a graphical representation of your physical disks and the partitions they contain, each outlined in green.

2 Modifying a partition size couldn't be easier — right-click on the partition and select **Resize/Move**. Now hover the cursor over the right arrow and drag it to the left to shrink the partition. Use the boxes to manually change the values if you want a fine degree of control over the resizing, then click **Resize/Move** again.

3 The GUI shows the updated changes and also a task box at the bottom of the screen. The changes haven't actually been made; they've just been scheduled to run. To commit the changes and resize the partition, click **Apply**. GParted will ask to confirm the changes — hit **OK** and away you go. And that's it.

Now, kick off the Vista install again.

This is where life gets interesting. In our case, Ubuntu Linux was installed on our PC.



We shrunk the ext3-formatted data partition with GParted. But when we tried to install Vista to the newly created unallocated space, it came up with an error that it was unable to locate a partition which met the system requirements. This was strange because visually, the partition configuration was basically the same as in the XP scenario.

In fact, Vista has to install to a primary partition, but for some reason it can handle not installing to a primary partition when the pre-existing partition is running Windows XP.

With Linux or Mac OS X, Vista has a tougher time. So the way around this is to make the Linux partitions inactive first. The best way to do this is to load DiskPart.exe, a text-mode command interpreter that lets you manage disks, partitions or volumes from a command prompt or with scripts.

You can find DiskPart.exe on the BartPE CD, or by selecting the Repair option from the Vista DVD. You can also download it from Microsoft at <http://snipurl.com/kzpd>.

Use DiskPart to select the disk with the Linux partitions and go through and mark each

one as inactive. We're going to use the DiskPart on the Vista DVD for this. Follow these steps:

1. Boot from the Vista DVD
2. Go past the language selection screen
3. Select "Repair your computer"
4. Click "Next" past the System Recovery Options page
5. Select the "Command Prompt" recovery tool
6. Type in "DISKPART"
7. Select the primary disk "SELECT DISK 0"
8. Show the partitions "LIST PARTITION"
9. "SELECT PARTITION 1"
10. "INACTIVE"
11. Repeat steps 9 and 10 for all remaining partitions
12. "EXIT"
13. Select Restart

Go back to the Vista install, choose the unallocated space and hit Next. Vista brings up a new window saying it has found enough free space on the disk and can create a partition — accept this message and the installation

continues. Rather awkward, but it gets the job done.

Once Vista boots up, install EasyBCD (<http://neosmart.net/dl.php?id=1>) along with the EasyBCD patch for GRUB (http://neosmart.ath.cx/nst_grub.zip)

First, install EasyBCD 1.5. Then add the patch by creating a Linux entry in the Vista bootloader via EasyBCD (name it whatever you like, for instance, "Linux"), then browse to C:\NST, the directory created by the EasyBCD.

Unzip the contents of the patch into C:\NST\ and reboot to replace the existing nst_grub.mbr file with the new patch in the ZIP archive. When prompted, select "NST Linux Loader" (or whatever custom name you gave it) and hit the key. GRUB should then load.

Go into Add/Remove entries and select Linux/BSD. Change the interface to GRUB and type in a name, then Add Entry, and the bootloader is updated.

OPTION 2 — INSTALL VISTA FIRST

A slightly easier method than having to get Vista installed using DiskPart and



5

Administrator: X:\windows\system32\cmd.exe - diskpart

```
REPAIR      - Repair a RAID-5 volume with a failed member.
RESCAN     - Rescan the computer looking for disks and volumes.
RETAIN     - Place a retained partition under a simple volume.
SELECT     - Shift the focus to an object.
SETID      - Change the partition type.
SHRINK     - Reduce the size of the selected volume.
```

DISKPART> list partition

There is no disk selected to list partitions.
Select a disk and try again.

DISKPART> select disk 0

Disk 0 is now the selected disk.

DISKPART> list partition

Partition ###	Type	Size	Offset
Partition 1	Primary	1137 MB	32 KB
Partition 2	Primary	7844 MB	1137 MB
Partition 3	Primary	11 GB	9 GB

DISKPART>

Administrator: X:\windows\system32\cmd.exe - diskpart

DISKPART> select partition 1

Partition 1 is now the selected partition.

DISKPART> inactive

The current partition is already marked inactive.

DISKPART> select partition 2

Partition 2 is now the selected partition.

DISKPART> inactive

DiskPart marked the current partition as inactive.

DISKPART> select partition 3

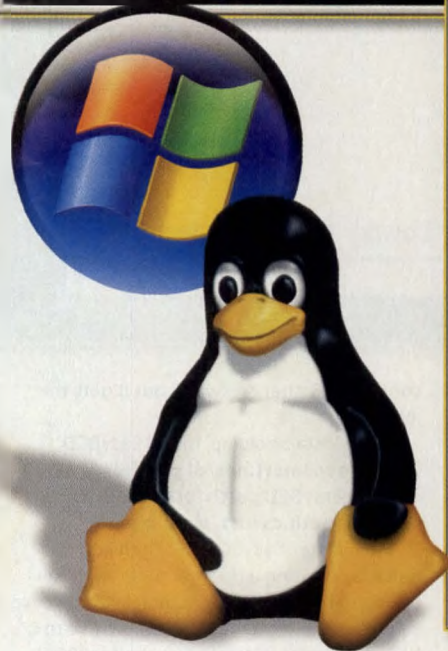
Partition 3 is now the selected partition.

DISKPART> inactive

The current partition is already marked inactive.

DISKPART>

6



potentially damaging the Linux partitions is to install Vista first to a smaller partition — leaving free space on the disk. After you've done this, install Linux. As mentioned previously, the GRUB bootloader does a good job of recognising that Vista is installed — and will support it.

However, if you want to see the Vista boot manager, load up the Vista installation, install EasyBCD, go to "Manage Bootloader" and "Reinstall the Vista Bootloader" (then GRUB is overwritten). You can then configure the Vista bootloader to add Linux to the boot menu.



THE MORE HARD DISK SPACE YOU GIVE TO EACH OPERATING SYSTEM, THE BETTER THEY WILL RUN

A good rule of thumb when experimenting with dual-booting is to have a large hard drive so you don't end up squeezing each OS through a lack of space — the more you give each system, the better they will run.

And that's about it for dual-booting with Vista! When you're dealing with multiple OSS,

you'll always need a few tools on hand to tackle each stage, and the ones we've included on the cover DVD will get you through pretty much anything. apcmag.com/dualboot is an online resource for dual-booters, with screen-by-screen tutorials, the latest updates for dual-booting utilities and reader feedback as well. [ETC](#)

BEST TECH

APC's independent reviewers point to the best technologies in the top-selling product categories each month. We only change products when a better one comes along. What you see here is the best technology available on the market.

THE BEST GEAR
IN 50 CATEGORIES!
ONLINE AND IN THE
MAGAZINE



The **Best Overall** award is for products we believe are the best, regardless of price.



The **Best Value** award is for those which offer a good combination of features for a reasonable price.

Best Tech is edited by William Maher. Contributors to the APC Best Tech guide: Seamus Byrne, Ashton Mills, Nick Race, Tony Sarno, Adam Turner, Dan Warne, Chris Zammit and Stephen Withers.



DESKTOP PCS – GENERAL USE

Enspire Digital Vitesse XP2

CONTACT Enspire Digital
ONLINE www.enspiredigital.com.au
PHONE 1300 880 070
PRICE \$2,687 (our spec)



We specced this machine on the Enspire site, with the right mix of features for work and play. Under the hood is Intel's flagship Core 2 Duo E6600 (2.4GHz) with 1GB of RAM, a Samsung 19in 8ms screen and GeForce 7600GT graphics card. Classy touches include the Logitech MX3000 Cordless Desktop set and Logitech 5.1 speakers.

PC Quest M2 Core

CONTACT PC Quest
ONLINE www.pcquest.com.au
PHONE 1300 550 118
PRICE \$1,510 (our spec)



When it comes to cheap, do-everything machines, there's a lot of rubbish out there from the big brands. Not so with PC Quest. This system has a dual-core Athlon 64 X2 3800+ on AMD's new AM2 platform, plus 1GB of RAM and a 19in LCD. Also, the ATI Radeon x1600 Pro is a capable card for occasional gaming.

DESKTOP PCS – BUSINESS

Dell OptiPlex 745 mini tower

CONTACT Dell
ONLINE www.dell.com.au
PHONE 1300 303 107
PRICE \$1,419 (our spec)



With Intel's new Core 2 Duo onboard, this represents the top of the line in a business computing platform. Key features include a Core 2 Duo E6300 (1.8GHz) chip, 1GB DDR2 RAM, a 160GB Serial ATA hard drive, and 3-year next-business-day on-site warranty. Price includes 17in LCD monitor (analogue).

Dell OptiPlex GX520 mini tower

CONTACT Dell
ONLINE www.dell.com.au
PHONE 1300 303 107
PRICE \$1,269 (our spec)



You'll get cheaper machines with a Pentium 4 or Sempron, but we think it's time for dual-core. This Pentium D box beats big names like Lenovo for price (though ASI Solutions comes close). Our spec includes a Pentium D 820 CPU, 512MB RAM, stable image and Dell OpenManage IT Assistant.

MOTHERBOARDS

EVGA Nvidia 680i motherboard

CONTACT Shadow Entertainment
ONLINE www.shadowentertainment.com.au
PHONE (03) 9785 6570
PRICE \$450



If you're building a high-performance PC based around a Core 2 Duo or Core 2 Quad, this is the motherboard to do it on. Six SATA 2 ports, PAT, two PCI Express x16 slots, two GigE ports, 10 USB 2.0 connections, full Core 2 Duo and Core 2 Quad support with a 1,066MHz FSB.

Foxconn P9657AA-8KS2H

CONTACT Foxconn
ONLINE foxconnchannel.com
PHONE N/A
PRICE \$165



This board only has a single x16 PCI Express slot, so it can't be used for CrossFire or SLI. However, it also has one x1 and one x4 PCI slot ready for the next-generation of PCI-E expansion cards. Combine this with HD audio, five SATA and one eSATA port and you've got top value for your money.

VIDEO CARDS

Nvidia GeForce 8800 GTX

CONTACT Nvidia
ONLINE www.nvidia.com
PHONE N/A
PRICE Approx. \$930



NEW ENTRY

If you're after the most powerful beast on the graphics market, this is it (for the moment). It's hot enough to use as a BBQ, but on the upside it's DirectX 10-ready, so you'll be at the bleeding edge for gaming under Windows Vista. This card cranked out 11,840 in 3DMark06 for APC, beating even a CrossFire setup.

Nvidia GeForce 7600 GT

CONTACT Nvidia
ONLINE www.nvidia.com
PHONE N/A
PRICE Approx. \$210



Nvidia's recently released mainstream card, the GeForce 7600 GT raises the bar for price compared to performance. With significant performance boosts over the last-generation 6600 GT card, the 7600 GT also comes with support for SLI, allowing performance to spiral even higher.

LCD MONITORS

Dell 2407WFP

CONTACT Dell
ONLINE www.dell.com.au
PHONE 1300 303 107
PRICE \$1,099



If you're a gamer or entertainment lover with cash to drop on a new monitor, look no further. This model not only offers a gorgeous 24in wide-screen monitor but doubles as a low-cost entertainment screen and TV for console gaming in high-def. Its 450cd/m² brightness and 1,000:1 contrast ratio are top-shelf.

BenQ FP71G+

CONTACT BenQ
ONLINE www.benq.com.au
PHONE (02) 9352 8800
PRICE \$329



Proof that good things do come in small packages, this 17in LCD screen manages to remain at a low price point while still delivering an 8ms response time. There is no DVI, but this 1,280 x 1,024 monitor will definitely satisfy most run-of-the-mill computing jobs with ease.

OPTICAL DRIVES – DVD

Sony DRU-820

CONTACT Sony
ONLINE www.sony.com.au
PHONE 1300 137 669
PRICE \$120



Sony's DRU-820 internal double-layer DVD burner is a ripper (if you'll excuse the pun), with support for DVD-RAM, DVD+/- and double-layer discs. It ships with Nero 6.6 and can write DVDs at up to 16x. A one-year warranty is included and the drive ships with both black and beige face-plates. An external model is also available for \$239.

Pioneer DVR-A11XLA

CONTACT Pioneer Electronics
ONLINE pioneeraus.com.au
PHONE 1800 338 439
PRICE \$99



Now into its 11th-generation release, this DVD burner is a steal for only \$99. Industry-leading NERO 7 Essentials burning software is included and the drive itself offers a zippy 16x burn speed. The Pioneer drive is an excellent upgrade for an ageing system and a very solid alternative to Sony's model.

INTERNAL HARD DISKS

Seagate Barracuda 7200.10 750GB

CONTACT Seagate
ONLINE www.seagate.com
PHONE (02) 9891 0087
PRICE Approx. \$980



It may not be on the shelves when this issue of APC hits the streets, but it won't be too far off. This 750GB whopper scored well in our benchmarks and – just think about it – you only need two of these for 1.5TB of storage! It's available in PATA and SATA, but who uses PATA these days?

Seagate Barracuda 7200.10 320GB

CONTACT Synnex
ONLINE www.synnex.com.au
PHONE 1300 100 100
PRICE \$225



Seagate's Barracuda 7200.10 is quiet and packs plenty of punch, but be careful in tight enclosures: It's hot. Though the RRP for this drive is \$225, they can be found on the street for less than \$200. The 16MB cache model is fast enough for most uses, but if you're serious about video editing, splurge for a 10,000rpm drive.

EXTERNAL HARD DISKS

LaCie Bigger Disk Extreme 2TB

CONTACT LaCie
ONLINE www.lacie.com/au
PHONE (02) 9669 6900
PRICE \$1,695



NEW ENTRY

So your friend has been boasting about their 1TB external like it's the bee's silicon knees? Pfft – LaCie's latest release packs 2TB into a single device, tossing in three different interface options of FireWire 400, FireWire 800 and USB 2.0. As far as external drives go, it doesn't get bigger than this. For now.

Western Digital My Book

CONTACT Synnex
ONLINE www.wdexternal.com.au
PHONE 1300 100 100
PRICE \$299



With more than double the capacity of our previous best value drive (which was also WD) at only a slightly higher cost, here you get 250GB of storage in a classy black enclosure equipped with Google Desktop software for quick file finding. It's got USB 2.0 (and the smart power-on/off feature is a nice touch).

USB ULTRA-PORTABLE

Lexar Jumpdrive Lightning

CONTACT Lexar
ONLINE www.lexar.com.au
PHONE (02) 9034 8625
PRICE \$79.95 (1GB)



This ultra-quick Lexar functions like any other memory key, but includes a PowerToGo feature – you can install apps to the drive that can be run on any PC. It doesn't make any changes to the host OS and stores files locally on the key, so you can take it all with you when you leave; ideal for students or support staff.

Sandisk Cruzer Micro

CONTACT Sandisk
ONLINE www.sandisk.com
PHONE 1800 793 652
PRICE \$47 (1GB)



Sandisk's Cruzer Micro top-notch. The simple design includes a retractable USB connector and ships with a lanyard. The key includes the U3 software platform that allows users to install custom apps – just like Lexar's PowerToGo feature. It's a touch slower than its competitor, but it's also \$20 cheaper for the 1GB capacity.

MEDIA ADAPTORS

Zensonic Z500 HD Network DVD

CONTACT Zensonic
 ONLINE www.zensonic.com.au
 PHONE (08) 8322 9544
 PRICE \$569



If you want to get your digital media from the study to the lounge room, the Z500 can handle anything you throw at it. It's a progressive-scan MPEG4/DVD player with HDCP-compatible HDMI, plus built-in Ethernet and 802.11b/g for streaming internet access and playing music, photos and movies from any PC on your home network.

Mediategate MG-350HD

CONTACT Anyware Computers
 ONLINE www.anyware.com.au
 PHONE (03) 9763 8200
 PRICE \$399



The Mediategate MG-350HD is one of the simplest ways to get high-definition action into your lounge room (up to 1,080p resolution). Whack a desktop hard drive inside and the Mediategate plays just about any audio, video or image file you care to throw at it – from the drive or via Ethernet or Wi-Fi.

NAS / MEDIA

Iomega StorCenter 1TB

CONTACT Iomega
 ONLINE www.iomega.com.au
 PHONE 1800 466 342
 PRICE \$1,999



The Iomega StorCenter provides a nominal terabyte of storage that can be configured as RAID 0, 1 or 5, plus Gigabit Ethernet, 802.11g wireless (WEP or WPA) and support for UPnP AV media players. Two USB ports enable connection for external drives, a shared printer or a digital camera.

Maxtor Shared Storage Plus

CONTACT Maxtor
 ONLINE www.maxtor.com.au
 PHONE (02) 9369 3662
 PRICE \$399-\$699 (200GB-500GB)



Maxtor's Shared Storage Plus provides 200GB to 500GB of network storage, with the ability to stream media files to UPnP AV media adaptors – without the intervention of a PC. USB ports allow for connection of printers and external disk drives for additional storage should you need it.

SERVERS – SMALL BUSINESS

PowerEdge 2900

CONTACT Dell
 ONLINE www.dell.com.au
 PHONE 1800 812 393
 PRICE From \$3,487



This Dell is a beauty. It's dual-socket, dual-core and sports up to two of the new Intel Woodcrest Xeons. The default config features a single Xeon 5140 at 2.33GHz with 1,333MHz FSB, backed by 2GB of DDR2 533 FB DIMMS and an 80GB SATA II hard drive. Dell offers a 3-year on-site warranty on this hugely upgradable server.

HP ProLiant ML110 G3 SMB Bundle

CONTACT HP
 ONLINE www.hp.com.au
 PHONE 1300 305 017
 PRICE \$1,499



Not a real powerhouse, but the price can't be beaten. This unit is a single CPU Pentium 4 3.0GHz with 1GB of RAM and two 80GB hard disk drives. Though it won't break any speed records, it will suit a small business's needs. The server is bundled with Microsoft Small Business Server 2003 Standard Edition.

NOTEBOOKS – MEDIA CENTRE

Sony VAIO VGNAR28GP

CONTACT Sony
 ONLINE www.sony.com.au
 PHONE 1300 137 669
 PRICE \$5,499

NEW ENTRY



Still not cheap, but now Sony's Blu-ray notebook is even better with the introduction of the Core 2 Duo processor. Other additions to the spec include 4MB L2 cache (up from 2MB) and a 200GB hard drive (up from 160GB). Keep in mind that battery life is terrible at 1.5 hours – plug this one into the wall.

Toshiba Qosmio G30

CONTACT Toshiba
 ONLINE www.isd.toshiba.com.au
 PHONE 13 30 70
 PRICE \$4,299



Generous specs combined with an analogue/digital TV tuner and Media Center really does make this a portable entertainment device (if 4.6kg doesn't make your back cry). This puppy has enough graphics power to not only drive the gorgeous 17in LCD, but also to make current games look great.

NOTEBOOKS – BUSINESS

Lenovo ThinkPad X60

CONTACT Lenovo
 ONLINE www.lenovo.com.au
 PHONE 1300 557 073
 PRICE From \$2,949



Business is all about portability – after all, there's no point having a notebook if you're hopping between power points all day. At 1.67kg and shipping with a better than average 8-cell battery, the X60's eight and a half hour run-time on a single charge will keep you going all day long.

Dell Inspiron 6400

CONTACT Dell
 ONLINE www.dell.com.au
 PHONE 1800 812 393
 PRICE From \$1,329



It's impressive seeing Intel's Core Duo platform in a mid-sized package under \$1,500. Dell hasn't skimped heavily on other key features either, including a 15.4in wide-screen LCD. The 6400 will play and burn DVDs, and battery life is rated for three hours. Weight starts at a tolerable 2.8kg.

NOTEBOOKS – ULTRAPORTABLE

Toshiba Libretto

CONTACT Toshiba
 ONLINE www.isd.toshiba.com.au
 PHONE 13 30 70
 PRICE From \$3,499



You had better make sure to look closely when shopping for a notebook or you might miss this one. At just 7.2in, the display is tiny (and the keyboard matches). Don't be fooled by the chassis though, there's plenty of grunt inside (and you can throw it into your backpack with room to spare).

Sony VGNTX27GPT

CONTACT Sony
 ONLINE www.sony.com.au
 PHONE 1300 138 246
 PRICE \$3,699



This is the bigger brother of the TX17GP. Here in the APC Labs we were blown away by its crisp display, tiny form factor and excellent battery life. Able to run over eight hours on a single charge (and with an optional extended battery, there's no need to worry if you forget to pack your charger).

SMARTPHONES

BlackBerry 8707G

- CONTACT Optus
- ONLINE www.optus.com.au
- PHONE 1300 301 937
- PRICE \$999 outright (or plans)



This new BlackBerry has the basics perfected. A big, bright screen, fine-tuned QWERTY keyboard, 3G wireless that can also be used as a laptop modem and the BlackBerry email service. Once you get the hang of the keyboard shortcuts, you can whip around the 8707G's interface like lightning.

Nokia E61

- CONTACT Nokia
- ONLINE www.nokia.com.au
- PHONE 1300 366 733
- PRICE \$749



It's hard to fault Nokia's 3G "BlackBerry Killer": it has the comfortable BlackBerry form factor along with a QWERTY keyboard and fits comfortably in your pocket – plus, you can take your pick of push email service. There are two other killer features: inbuilt Wi-Fi and Nokia's new web browser.

PRINTERS – HOME

Canon PIXMA iP5300 Bubble Jet

- CONTACT Canon
- ONLINE www.canon.com.au
- PHONE 1800 021 167
- PRICE \$249



This is the perfect all-rounder for the home. It prints high-quality photos and churns through mono text documents at speeds of up to 31ppm, with quality approaching that of a laser. It can also print directly to CDs and DVDs. The iP5300 will deal with school projects, digital photos, documents, anything!

Epson Stylus C79

- CONTACT Epson
- ONLINE www.epson.com.au
- PHONE 1300 361 054
- PRICE \$89



This is a cheap and cheerful printer that still delivers good results. With its four separate ink cartridges and extra-fine printing, it marries good print and photo quality with print speeds of up to 22ppm (black text) and 12ppm (colour). Be aware that your main ongoing cost will be the ink.

PRINTERS – SMALL BUSINESS

OKI C3400 LED Laser

- CONTACT OKI
- ONLINE www.oki.com.au
- PHONE 1800 800 140
- PRICE \$878



Essentially a high-performance colour laser for just over \$800. The OKI C3400 surpassed all the other sub-\$1,000 lasers in our recent Labs Challenge in print speed and quality because it uses slightly different LED laser technology. Consumable costs are slightly higher because the toner cartridges only do 1,000 pages, but it's a superior performer.

Lexmark E120n

- CONTACT Lexmark
- ONLINE www.lexmark.com.au
- PHONE (02) 8401 3000
- PRICE \$188



The outstanding value of this package sent the APC office into raptures. The E120n is a 20ppm mono laser printer, with an Ethernet print server built in, for only \$188. Connect it to your ADSL modem/router and you can print wirelessly from anywhere in the house. Cartridges are not expensive either.

MULTIFUNCTION – HOME

Canon Pixma MP830

- CONTACT Canon
- ONLINE www.canon.com.au
- PHONE 1800 021 167
- PRICE \$549



The MP780's successor, the MP830 soundly beats the competition. It can print photo-lab-quality 4 x 6in home snaps and has all the gear needed by a home office, such as a copier, scanner and G3 fax machine (together with an automatic 35-page document feeder and duplexing ability).

Lexmark X5470

- CONTACT Lexmark
- ONLINE www.lexmark.com.au
- PHONE (02) 8401 3000
- PRICE \$249



This Lexmark is probably the first attempt to create a multifunction printer that actually looks stylish. On top of that, the machine also performs well, with print speeds up to 25ppm black and 18ppm colour, a 10-sheet automatic document feeder, plus PC-free photo, fax and copy capabilities.

MULTIFUNCTION – BUSINESS

EPSON Aculaser CX11NF

- CONTACT EPSON
- ONLINE www.epson.com.au
- PHONE 1300 361 054
- PRICE \$1,499



This colour laser multifunction printer won three of the six tests thrown at several MFPs in a recent APC Labs Challenge. Has good copy and scan speed, and does a great job with plain paper, where its fine detail and accurate colour impressed the judges. It can really replace your office printer, copier and fax machine.

Brother MFC-8860DN

- CONTACT Brother
- ONLINE www.brother.com.au
- PHONE (02) 9887 4344
- PRICE \$1,199



A mono (rather than colour) laser, this still has all the components to make it a powerful office or small department performer – such as a 28ppm network laser printer, a copier and a scanner with built-in duplexing, as well as LDAP capability (for accessing directory services). A great all-rounder for small businesses at the price.

ADSL2+ MODEM/ROUTERS

Billion 7404VGP

- CONTACT PC Range
- ONLINE www.billion.com.au
- PHONE (08) 8322 9544
- PRICE \$299



It's hard to beat on features and price. For your \$299, you get one of the fastest ADSL2+ modems in terms of actual throughput (average over 1km and 3.5km phone line length), robust 802.11g wireless networking (supporting WPA2 security) and four Ethernet ports. There's inbuilt VoIP and PSTN passthrough (if the VoIP ever fails).

Billion 7300G

- CONTACT PC Range
- ONLINE www.billion.com.au
- PHONE (08) 8322 9544
- PRICE \$169



Despite its low price, the Billion 7300G managed to trump all the other modems in our most recent ADSL2+ Labs Challenge on average speed across 1km and 3.5km line lengths. It includes four 10/100 ports as well as 802.11g (including WEP, WPA and WPA-2 security). The modem has configurable Quality of Service, too.

WIRELESS APs & ROUTERS

Linksys Wireless-N WRT300N

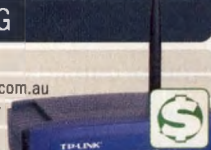
CONTACT Linksys
 ONLINE www.linksys.com.au
 PHONE 1800 678 808
 PRICE \$279.95



We're still not overly convinced that Draft N devices are the best devices in the long term, but if you want more speed for now, at least it gives you a chance of compatibility between brands and some hope of a firmware upgrade further down the track. The WRT300N has the best range among the Draft N routers we've tested so far.

TP-Link TL-WR541G

CONTACT Anyware
 ONLINE www.anyware.com.au
 PHONE 1300 269 927
 PRICE \$75



In our tests the TL-WR541G delivered solid connections at the same range as routers costing much more. It has the usual four-port 10/100 Ethernet switch plus regular features such as a (relatively simple) firewall, access controls, WPA2 authentication, DHCP and port triggering.

VOIP ADAPTORS

Netcomm V300

CONTACT NetComm
 ONLINE www.netcomm.com.au
 PHONE (02) 9424 2070
 PRICE \$199



Low upstream speeds on most broadband connections mean QoS support makes a big difference to how you sound during a VoIP call. In APC's testing, the V300 delivered good voice quality with minimum impact on data traffic. It also lets you use one handset for VoIP and PSTN calls.

Netcomm V100

CONTACT NetComm
 ONLINE www.netcomm.com.au
 PHONE (02) 9424 2070
 PRICE \$128



Connect the V100 to a power point, your network and a handset, and you're in business. Available as a generic model or preconfigured for certain VoIP providers, which makes it as simple as it gets. Some people prefer a box that allows more fiddling around with configurations, but we're attracted to the simplicity.

GPS DEVICES

TomTom GO 910

CONTACT TomTom
 ONLINE www.tomtom.com
 PHONE N/A
 PRICE \$1,179



Feature-crammed, with a 480 x 272 pixel TFT LCD touchscreen, 3D navigation software, maps of three continents on its 20GB hard disk and countless route options and points of interest. Best of all is its lightning-fast reaction time, immediately picking unexpected route changes and aligning maps quickly.

Navman N40i

CONTACT Navman Australia
 ONLINE www.navman.com
 PHONE (02) 9879 900
 PRICE \$899



The N Series takes up the NavPix "image-based navigation" theme and delivers it in an even smaller package. Compared to the N60i it has a smaller colour touchscreen and less flash memory. But, with an RRP of \$899, it has to be one of the best value GPS in-car units on the market today.

DIGITAL STILL CAMERAS

Canon PowerShot G7

CONTACT Canon
 ONLINE www.canon.com.au
 PHONE 13 13 83
 PRICE \$899



Here is an excellent example of the power you can get without dropping all your dough on a DSLR. Short of interchangeable lensing, the G7 still delivers excellent manual controls and a wealth of features unmatched by most of the non-SLR digital market. Very big prints are viable with its 10MP resolution.

Panasonic Lumix DMC-FX01

CONTACT Panasonic
 ONLINE www.panasonic.com.au
 PHONE 13 26 00
 PRICE \$549



The Lumix camera range features excellent Leica lensing, and the FX01 delivers a wide-angle 28mm lens with a zoom range out to 102mm. For the money spent, you're getting 6 megapixel resolution along with some first-rate optical stabilisation. The 2.5in LCD is extremely bright.

DIGITAL VIDEO CAMERAS

Panasonic AG-HVX202EN

CONTACT Panasonic
 ONLINE www.panasonic.com.au
 PHONE 13 26 00
 PRICE \$9,900



The first of the next-generation pro-grade cameras (and inside \$10K). Record in DV or various DVCPRO formats, with support for 720p and 1080i HD. With support for DV tape and the new P2 flash media format, as well as pro audio features and new lensing technology, this is nova hot right now.

Sony HDRSR1

CONTACT Sony
 ONLINE www.sony.com.au
 PHONE 1300 137 669
 PRICE \$2,499



Finally, a hard drive handycam which delivers high-definition that goes beyond HDV. The new AVCHD format is excellent, with variable bit rates to suit your different shooting needs. Plus, there is also great buffer features and hard disk shock protection to ensure a long (healthy) life for your investment.

PROJECTORS

Optoma HD72

CONTACT Amber Technology
 ONLINE www.ambertech.com.au
 PHONE 1800 251 367
 PRICE \$4,750



Optoma's outstanding DLP-based projector offers full 720p HD resolution for less than \$5,000. The 3.1kg unit produces a clear, consistent image with controls to adjust brightness, contrast, image shift and keystone, through dedicated buttons on the remote control. This helps the viewer adjust the image to match each movie.

Toshiba S8 DLP

CONTACT Toshiba
 ONLINE www.toshiba.com.au
 PHONE (02) 9887 6000
 PRICE \$1,999



If you're after a basic projector to handle some gaming, movies and web surfing, the S8 is a safe bet. It has 800 x 600 pixel resolution, 2,000:1 contrast ratio, and composite, S-Video and VGA inputs. Better still, the maximum 3,000-hour (economy mode) lamp life means you won't have to buy pricey bulbs every few months.

TV TUNERS

Pinnacle PCTV 310i

- CONTACT Lako Pacific
- ONLINE www.lakopacific.com
- PHONE (03) 9455 7444
- PRICE \$199.99



What's not to like about the 310i? With analogue and digital TV tuners (plus FM radio) on one card, it's the complete package. The software delivers PVR features with recording to DivX or MPEG-2 files, or direct to DVD. A remote control is included; there's even an S-Video/composite input to digitise analogue home videos.

Compro VideoMate U500

- CONTACT Anyware
- ONLINE www.anyware.com.au
- PHONE 1300 269 927
- PRICE \$99



The Compro VideoMate U500 is a USB dongle, so you can use it with desktops or notebooks (but you may need a better antenna than the one included in order to receive all channels). Scheduled recording is easy enough to set up, plus it's possible to record directly to a DVD or an ISO.

IT'S THE FASTEST WAY TO FIND THE BEST PC GEAR IN AUSTRALIA!

APC's Best Tech list is now online at www.apcmag.com/BestTech

We got sick of our neighbours/brothers/cousins bugging us for info about the best gear to buy, so now we're posting it all online: our favourite killer products across 50 categories.

Get all our inside tips on the best notebooks, LCD TVs, modems, printers and more.

HD TVs

Sony Bravia KDL40X2000

- CONTACT Sony
- ONLINE www.sony.com.au
- PHONE 1800 021 167
- PRICE \$549



The Bravia is set apart from the competition by its signature styling, featuring a "floating glass" design — this screen looks expensive, and it is. This is full HD resolution of 1,920 x 1,080, unlike some cheaper value screens (see Acer's value range). For the price, you're also getting an integrated HD digital tuner and 2 HDMI inputs.

Acer AT3705-DTV

- CONTACT Acer
- ONLINE www.acer.com.au
- PHONE 1300 362 328
- PRICE \$2,899



Sure, this high-definition television isn't a traditional audio-visual brand, but Acer are definitely good value for money. For less than \$3,000 you're getting a 37in full high-definition resolution (1,920 x 1,080) LCD screen including analogue and digital TV tuners.

PERSONAL VIDEO RECORDERS

Topfield TF6000PVRt

- CONTACT Topfield
- ONLINE www.topfield.com.au
- PHONE 1300 889 803
- PRICE \$1,249



The addition of Wi-Fi provides wireless downloads of electronic program guides from IceTV, allowing you to record TV shows by name rather than timeslot. This Topfield has dual digital tuners and a 200GB hard drive (was 160GB). It's also now easier to copy files off the unit for playback on your PC.

Foxtel iQ

- CONTACT Foxtel
- ONLINE www.foxtel.com.au
- PHONE 1800 150 077
- PRICE \$14.95/mth



Admittedly, the 160GB Foxtel iQ sits awkwardly in the category of PVRs, because it's inextricably tied to Foxtel's Pay TV service. But if you do happen to be a Foxtel subscriber, the 160GB iQ is absolutely worth the money. Foxtel has removed the upfront fee, so it's now just \$14.95 a month.

PORTABLE MUSIC PLAYERS

iPod 80GB

- CONTACT Apple
- ONLINE www.apple.com.au
- PHONE 13 36 22
- PRICE \$499



Now this is getting really mental. Truly an insane amount of storage (20,000 songs), which is enough to knock Creative's Zen Vision: M off the top of our list. The screen is now brighter and gives up to 20 hours of battery life. It's not cheap, but yet again, Apple's iPod is the best.

iPod shuffle 1GB

- CONTACT Apple
- ONLINE www.apple.com.au
- PHONE 13 36 22
- PRICE \$119



We're not turning into iPod fanboys, but for RRP value we still can't go past the shuffle, which has had a design overhaul and a price cut. It's now so small that fashion models must use their fingertips to hold it in press photos. 1GB of memory gives you up to 240 songs.



BIGPOND™

in brief

Could BigPond Cable become the fastest?

Cable bandwidth set to be freed up from Foxtel's analogue service could well lead to dramatic gains for BigPond Cable.

Rumours are circulating that BigPond could be set to upgrade its cable broadband technology to leapfrog ADSL2+ operators, as Foxtel prepares to shut down the analogue channels on its cable.

Foxtel CEO, Kim Williams, said late last year that ninety-nine per cent of all Foxtel subscribers were already on Digital pay TV — and the remaining one per cent should be switched over by January.

Once that happens, Foxtel will be able to completely shut down its analogue pay TV network, which runs in parallel over the same cable as Foxtel Digital and BigPond Cable. It will free up a massive amount of bandwidth on the cable, opening the door for BigPond

to dramatically increase broadband speeds.

Although Telstra has been slow to come to the table with faster broadband, its main complaint has been infrastructure access regulations — the company is adamant that its competitors shouldn't be allowed to sell services based on Telstra's network at what it claims are below-cost wholesale rates.

However, the cable network is already completely closed and unregulated, which gives BigPond the exclusive rights to resell it. It's likely that Telstra will seize on this opportunity to market BigPond Cable as the premium broadband choice in Australia.

BigPond recently completed a total network upgrade (including replacing older CDLP customer

modems) to the Data Over Cable Interface Service (DOCSIS) 1.1 standard, which allows download speeds of 40Mbit/s and upload speeds of 30Mbit/s. To date, Telstra has only marketed plans at 17Mbit/s, but with extra Foxtel bandwidth, it could ramp up speed significantly.

The DOCSIS 3.0 standard, only finalised in August last year, boosts speed to 160Mbit/s downstream and 120Mbit/s upstream. Telecommunications analyst Paul Budde says it probably won't be affordable until 2008-10; however, Telstra's new management team has shown a willingness to install expensive new technologies — its HSDPA wireless network was among the first in the world and is the largest.

Dan Warne

DEATH TO PCMCIA?

Wireless broadband networks are starting to make the shift away from PCMCIA. 3 has released an HSDPA ExpressCard34 which will fit new laptops from Dell, Apple and others. Vodafone has also released its Huawei USB modem (pictured) — a little bigger than a box of tic tacs and capable of 3.6Mbit/s speed (though at the time of writing, almost all of Vodafone's network was still using the HSDPA 1.8Mbit/s standard). BigPond also has a USB "memory stick"-style HSDPA modem which should be available by the time you read this.



your monthly broadband guide

APC is proud to partner with the independent broadband price-monitoring service Broadband Choice (broadbandchoice.com.au) to bring you the best ADSL and cable deals.

The comparison table on the following pages focuses on internet service providers that best serve the majority of APC readers' needs — those that have national coverage (though we have included some ISPs that provide higher than 2Mbit/s speed services in limited areas).

Only those meeting at least three of our four plan selection criteria are listed:

Budget plan: cheapest deal under \$35/month.

Light plan: cheapest deal under \$60/month, with at least 512Kbit/s speed and 1GB data.

Family plan: largest download allowance under \$80/month, at least 512Kbit/s and 10GB data.

High-speed: cheapest 1.5Mbit/s plan under \$100/month, with 10GB data minimum.

If an ISP has "unlimited downloads" but speed is throttled after reaching a certain limit, the portion in which you can get full-speed downloads is listed as its limit.

APC has picked the lowest price for a contract period of six months or less for broadband installation. Otherwise, the lowest-priced option was selected.

The installation price doesn't include a modem because you may find you'll get better value by buying one separately.

Can't find your provider in our list? That's because some of the largest ISPs, and many smaller ones, didn't meet the selection criteria. There may be ISPs we didn't list that will provide better deals (but which only service your local area or state).

ISPs enter their own information into the Broadband Choice database. ISPs can contact bc@whirlpool.net.au for more details on how to become part of the database.

Data for our table was extracted from the Broadband Choice database on 4 December 2006.

FREE BROADBAND IN NSW ANNOUNCED

The NSW State Government has announced a plan to build free Wi-Fi networks in seven areas in and around Sydney: central and north Sydney, Parramatta, Penrith, Liverpool, Newcastle, Wollongong and Gosford. It will start gathering expressions of interest from Wi-Fi operators this year. Premier Morris Iemma said: "Tourists and business visitors, now accustomed to this type of technology in other global cities such as San Francisco and Paris, will have improved email and internet access." Mr Iemma also indicated that the move would help to boost the State economy.



Name	Phone	Online	Budget plan (under \$35)	Light plan (under \$60, at least 512Kb/s, minimum 1GB data limit)	Family plan (under \$80, at least 512Kb/s, minimum 10GB data limit)	High-speed plan (under \$100, at least 1.5Mb/s, minimum 10GB data limit)	National	Spam filtering	Setup fee and contract length	Rapid transfer
Super-fast broadband ISPs (faster than 1.5Mb/s)										
Dodo ADSL2+	13 24 73	www.dodo.com.au	\$29.90† 1GB+^ 24Mb/s	\$29.90† 1GB+^ 24Mb/s	\$59.90† 20GB+^ 24Mb/s	\$49.90† 10GB+^ 24Mb/s	✓	✓	\$1.95 \$99 12mths	✗
HostCore DSL2	1300 781 097	www.hostcoredsl.com.au	\$29.95† 1GB 24Mb/s	\$29.95† 1GB 24Mb/s	\$69.95† 50GB 24Mb/s	\$49.95† 10GB 24Mb/s	✗	✓	\$1.95 \$149.95 1mth	✗
iNet broadband2+ ADSL (24Mbit)	13 19 17	www.inet.net.au	\$29.95† 500MB+ 24Mb/s	\$39.95 1GB 3Mb/s	\$69.95† 20GB+ 24Mb/s	\$59.95† 10GB+ 24Mb/s	✗	✓	\$79.95 6mths	✗
Internode Extreme ADSL2+	13 66 33	www.internode.on.net	N/A	\$59.95 20GB 24Mb/s	\$79.95 40GB 24Mb/s	\$59.95 20GB 24Mb/s	✗	✓	\$129 6mths	✗
Letsgo Go ADSL2+ 24Mbit	1300 556 114	www.letsgo.com.au	N/A	\$39.95† 60GB 24Mb/s	\$39.95† 60GB 24Mb/s	\$39.95† 60GB 24Mb/s	✗	✓	\$50 12mths	✗
OptusNet Cable	1800 504 504	http://broadbandsales. optusnet.com.au	\$29.95† 300MB+ 9.765625Mb/s	\$39.95† 2GB+ 9.765625Mb/s	\$69.95† 20GB+ 9.765625Mb/s	\$69.95† 20GB+ 9.765625Mb/s	✗	✓	\$89 12mths	✗
OptusNet DSL Direct	1800 504 504	http://broadbandsales. optusnet.com.au	\$29.95† 300MB+ 24Mb/s	\$39.95† 2GB+ 24Mb/s	\$69.95† 20GB+ 24Mb/s	\$69.95† 20GB+ 24Mb/s	✗	✓	\$89 12mths	✗
Primus up to 8000Kbps	1300 850 000	www.primus.com.au	\$29.95† 1GB 8Mb/s	\$29.95† 1GB 8Mb/s	\$69.95† 20GB 8Mb/s	\$59.95† 10GB 8Mb/s	✗	✓	\$118 1mth	✓
Telstra BigPond Cable	13 12 82	www.bigpond.com	\$29.95* 200MB^ 7.8125Mb/s	\$59.95† 10GB^ 7.8125Mb/s	\$59.95† 10GB^ 7.8125Mb/s	\$59.95† 10GB^ 7.8125Mb/s	✗	✓	\$189 12mths#	✗
TPG Residential ADSL2+	1300 360 855	www.tpg.com.au	\$29.99* 600MB 24Mb/s	\$39.99 3GB 24Mb/s	\$59.99 30GB 24Mb/s	\$49.99 18GB 24Mb/s	✗	✓	\$59.95 12mths	✗

Regular broadband ISPs (1.5Mb/s or less)										
1 2 3 ADSL	1300 885 646	www.123.net.au	\$29.99† 200MB 256Kb/s	\$49.99† 1.5GB 512Kb/s	\$69.99† No limit 512Kb/s	N/A	✓	✓	\$129 6mths	✓
aaNet ADSL	1300 665 076	www.aanet.net.au	\$27.90* 1GB 256Kb/s	\$33.90* 1GB 512Kb/s	\$74.90* 36GB 1.5Mb/s	\$64.90* 16GB 1.5Mb/s	✓	✓	\$145 6mths	✓
aaNet ADSL	1300 665 076	www.aanet.net.au	\$24.90* 1GB 256Kb/s	\$29.90* 1GB 512Kb/s	\$69.90* 36GB 1.5Mb/s	\$59.90* 16GB 1.5Mb/s	✓	✓	\$145 12mths	✓
AAPT ADSL	13 88 88	www.aapt.com.au	\$29† 500MB 256Kb/s	\$39† 12GB 512Kb/s	\$59† 15GB 1.5Mb/s	\$59† 15GB 1.5Mb/s	✓	✓	\$0 1mth	✓
Accusoft Freeway ADSL	1300 881 668	www.onmyweb.net	N/A	\$52.95 1.5GB 512Kb/s	\$75.95 15GB 512Kb/s	\$98.95 10GB 1.5Mb/s	✓	✓	\$132 6mths	✓
AuNix Broadband	1300 765 742	www.aunix.com.au	\$24.95† 15GB 256Kb/s	\$34.95† 25GB 512Kb/s	\$74.95† 35GB 1.5Mb/s	\$74.95† 35GB 1.5Mb/s	✓	✓	\$99 1mth	✓
Auritel Broadband	1300 669 254	www.auritel.com.au	N/A	\$59.95 25GB 512Kb/s	\$59.95 35GB 512Kb/s	\$89.95 35GB 1.5Mb/s	✓	✗	\$129 6mths	✓
Aussiewide Residential ADSL	1300 556 491	www.aussiewide.com	N/A	\$59.95 30GB 512Kb/s	\$59.95 30GB 512Kb/s	\$99 30GB 1.5Mb/s	✓	✓	\$110 6mths	✓
Australia On Line ADSL	1300 650 661	www.australiaonline.net.au	\$16.95* 200MB 256Kb/s	\$39.95 2GB 512Kb/s	\$54.95 No limit 512Kb/s	\$94.95 No limit 1.5Mb/s	✓	✓	\$99 6mths	✓
B Digital ADSL	13 33 44	www.mysoul.com.au	\$34.95† 5GB 256Kb/s	\$44.95† 5GB 512Kb/s	\$79.95† 10GB 1.5Mb/s	\$79.95† 10GB 1.5Mb/s	✓	✓	\$119 6mths	✓
Bit.net	1300 248 638	www.bit.net.au	\$19.95† 2GB 256Kb/s	\$29.95† 2GB 512Kb/s	\$69.95† 40GB 512Kb/s	\$59.95† 10GB 1.5Mb/s	✓	✓	\$132 6mths	✓
BKB Internet Home ADSL	1800 252 638	www.bkb.net.au	N/A	\$49.95 1GB+ 512Kb/s	\$64.95 10GB+ 512Kb/s	\$89.95 10GB+ 1.5Mb/s	✓	✓	\$139 6mths	✓
Blackstump ADSL	1800 890 600	www.blackstump.net.au	\$19.95† 200MB 256Kb/s	\$44.95† 5GB 512Kb/s	\$55.95† No limit 512Kb/s	\$72.45† 10GB 1.5Mb/s	✓	✓	\$108 6mths	✓
Bluemaxx ADSL	1300 791 990	www.bluemaxx.net.au	\$24.95* 200MB 256Kb/s	\$54.95 5GB 512Kb/s	\$74.95 30GB 512Kb/s	\$84.95 10GB 1.5Mb/s	✓	✓	\$105 12mths	✓
BBi Flat Rate DSL	1300 785 956	www.brownbear.net.au	\$32.95 2GB 256Kb/s	\$39.95 2GB 512Kb/s	\$74.95 60GB 512Kb/s	\$81.95 15GB 1.5Mb/s	✓	✓	\$119 6mths	✓
BBi Excess DSL	1300 785 956	www.brownbear.net.au	\$32.95* 2GB 256Kb/s	\$39.95* 2GB 512Kb/s	\$74.95* 60GB 512Kb/s	\$81.95* 15GB 1.5Mb/s	✓	✓	\$119 6mths	✓
Brown Bear DSL/Phone	1300 785 956	www.brownbear.net.au	\$19.95† 1GB 256Kb/s	\$29.95† 1GB 512Kb/s	\$69.95† 60GB 512Kb/s	\$76.95† 15GB 1.5Mb/s	✓	✓	\$119 6mths	✓
Bullet ADSL	1300 137 454	www.bullet.net.au	\$34.95* 500MB 256Kb/s	\$49.95* 5GB 512Kb/s	\$69.95* 25GB 512Kb/s	N/A	✓	✓	\$150 12mths	✓
CEInternet Broadband	1800 222 256	www.ceinternet.com.au	\$29.95* 200MB 256Kb/s	N/A	\$79.95 10GB 512Kb/s	\$99.95 10GB 1.5Mb/s	✓	✓	\$99 1mth	✓
Central Coast Internet ADSL	1300 730 947	www.cci.net.au	\$34.95* 500MB 256Kb/s	\$54.95* 1GB 512Kb/s	\$64.95* 10GB 512Kb/s	N/A	✓	✓	\$132 6mths	✓
Comcen Internet	1300 300 324	www.comcen.com.au	\$19.99* 200MB 256Kb/s	\$39.99* 1GB+ 512Kb/s	\$79.99 No limit 512Kb/s	\$69.99* 15GB+ 1.5Mb/s	✓	✓	\$99 6mths	✓
Comstech Systems ADSL	1300 550 664	www.comstech.com.au	\$32.95 500MB 256Kb/s	\$44.95 3GB 512Kb/s	\$69.95 50GB 512Kb/s	\$74.95 25GB 1.5Mb/s	✓	✓	\$129.95 6mths	✓
Concept Networks ADSL	1300 132 331	www.conceptual.net.au	\$29.95* 500MB 256Kb/s	\$39.95* 1GB 512Kb/s	\$69.95 No limit 512Kb/s	\$79.95* 15GB 1.5Mb/s	✓	✓	\$99 6mths	✓
Connexus Home ADSL	1300 133 888	www.connexus.net.au	\$27.95* 200MB+ 256Kb/s	\$59.95 10GB+ 512Kb/s	\$59.95 10GB+ 512Kb/s	N/A	✓	✓	\$149 6mths	✓
CyberOne ADSL	1300 720 062	www.cyberone.com.au	\$19.95† 200MB+ 256Kb/s	\$49.95† 5GB 512Kb/s	\$59.95† No limit 512Kb/s	\$69.95† 15GB 1.5Mb/s	✓	✓	\$99 6mths	✓
Cyberspace Internet ADSL	1300 138 977	www.cyberspace.net.au	\$21.95† 200MB 256Kb/s	\$46.95† 5GB 512Kb/s	\$57.95† No limit 512Kb/s	\$79.95† 10GB 1.5Mb/s	✓	✓	\$99 6mths	✓
DCSI	1300 665 575	www.dcsi.net.au	\$29.95 500MB 256Kb/s	\$49.95 10GB 512Kb/s	\$59.95 20GB 512Kb/s	\$79.95 20GB 1.5Mb/s	✓	✓	\$125 6mths	✓
DigiPlus	1300 765 600	www.digipius.com.au	\$29.95† 10GB 256Kb/s	\$42.95† 5GB 512Kb/s	\$49.95† 10GB 512Kb/s	\$89.95† 10GB 1.5Mb/s	✓	✗	\$99 1mth	✓
Dodo ADSL	13 24 73	www.dodo.com.au	\$29.90† 1GB+^ 256Kb/s	\$39.90† 1GB+^ 1.5Mb/s	\$59.90† 15GB+^ 1.5Mb/s	\$59.90† 15GB+^ 1.5Mb/s	✓	✗	\$99 6mths	✓
DragNet Budget ADSL	1800 069 050	www.dragnet.com.au	\$26.95* 200MB+ 256Kb/s	N/A	\$69.95 10GB+ 512Kb/s	\$95.95 10GB+ 1.5Mb/s	✓	✓	\$100 6mths	✓
DragNet Power ADSL	1800 069 050	www.dragnet.com.au	N/A	\$54.95* 1.5GB 512Kb/s	\$74.95 15GB 512Kb/s	\$95.95 10GB 1.5Mb/s	✓	✓	\$100 6mths	✓
EFtel ADSL	1300 550 550	http://w3.efitel.com	\$29.95* 400MB+ 256Kb/s	\$49.95† No limit 512Kb/s	\$49.95† No limit 512Kb/s	\$79.95† 40GB 1.5Mb/s	✓	✓	\$125 1mth	✓
eTelecom ADSL	1300 303 217	www.etelecom.com.au	\$19.95† 200MB 256Kb/s	\$39.95† 1GB 512Kb/s	\$69.95† 15GB 1.5Mb/s	\$69.95† 15GB 1.5Mb/s	✓	✓	\$99 12mths	✓
ezConnect ADSL	1300 303 637	www.ezconnect.com.au	\$30.80* 200MB 256Kb/s	N/A	\$69 10GB 512Kb/s	\$89.95 10GB 1.5Mb/s	✓	✗	\$120 3mths	✓
Fonebox ADSL Broadband Internet	1800 366 326	www.fonebox.com.au	\$29.90* 200MB 256Kb/s	\$49.90 5GB 512Kb/s	\$69.90† 30GB 512Kb/s	\$79.90 10GB 1.5Mb/s	✓	✓	\$99 6mths	✓
FutureWeb ADSL	1300 361 355	www.futureweb.com.au	\$31.95* 200MB 256Kb/s	\$49.95 1.5GB 512Kb/s	\$73.95 15GB 512Kb/s	N/A	✓	✓	\$99 6mths	✓
Global Dial ZapDSL	1300 130 710	www.globaldial.com	\$29.95* 300MB 256Kb/s	\$49.95 2GB+ 512Kb/s	\$79.95 No limit 512Kb/s	\$89.95 14GB+ 1.5Mb/s	✓	✓	\$99 6mths	✓
Goldweb ADSL	1300 366 065	www.goldweb.com.au	\$29.95* 200MB 256Kb/s	\$55 1.5GB 512Kb/s	\$80 15GB 512Kb/s	N/A	✓	✓	\$139 1mth	✓
Green Tree Frog ADSL	1300 854 820	www.greentreefrog.net.au	N/A	\$55 40GB 512Kb/s	\$77 100GB 512Kb/s	\$99 80GB 1.5Mb/s	✓	✓	\$132 6mths	✓
Green Tree Frog Business ADSL	1300 854 820	www.greentreefrog.net.au	N/A	\$55* 40GB 512Kb/s	\$77* 100GB 512Kb/s	\$99* 80GB 1.5Mb/s	✓	✓	\$132 6mths	✓
Hande Communications ADSL Shaped	1300 306 131	www.hande.net.au	\$32.95 500MB+ 256Kb/s	\$44.95 1.5GB+ 512Kb/s	\$79.95 30GB+ 512Kb/s	\$84.95 10GB+ 1.5Mb/s	✓	✓	\$119.95 1mth	✓
Hande Communications ADSL Usage Based	1300 306 131	www.hande.net.au	\$32.95* 500MB+ 256Kb/s	\$44.95* 1.5GB+ 512Kb/s	\$69.95* 15GB+ 512Kb/s	\$89.95* 15GB+ 1.5Mb/s	✓	✓	\$119.95 1mth	✓

Name	Phone	Online	Budget plan (under \$35)	Light plan (under \$60, at least 512Kb/s, minimum 1GB data limit)	Family plan (under \$80, at least 512Kb/s, minimum 10GB data limit)	High-speed plan (under \$100, at least 1.5Mb/s, minimum 10GB data limit)	National	Spam filtering	Setup fee and contract length	Rapid transfer
Regular broadband ISPs (1.5Mb/s or less)										
HugoNet Home ADSL Broadband	1800 424 683	www.hugonet.com.au	\$29.95* 250MB+ 256Kb/s	\$49.95* 1GB+ 512Kb/s	\$69.95 25GB+ 512Kb/s	\$89.95 20GB+ 1.5Mb/s	✓	✓	\$99 12mths	✓
iiNet broadband1 ADSL	13 19 17	www.iinet.net.au	\$29.95† 500MB+ 256Kb/s	\$49.95 2GB 512Kb/s	\$69.95 10GB 512Kb/s	\$99.95 15GB 1.5Mb/s	✓	✓	\$79.95 6mths	✓
ISP ADSL	1300 304 288	www.isp.net.au	\$29.70* 800MB 256Kb/s	\$39.60* 5GB 512Kb/s	\$77 No limit 512Kb/s	\$69.30* 25GB 1.5Mb/s	✓	✓	\$132 6mths	✓
Infinity Plus Residential DSL	1300 726 340	www.infinityplus.net.au	N/A	\$54.95† 25GB 512Kb/s	\$54.95† 25GB 512Kb/s	\$84.95† 30GB 1.5Mb/s	✓	✓	\$100 6mths	✓
Instant Communications ADSL	1300 139 369	www.in.com.au	\$30* 200MB 256Kb/s	\$52 5GB 512Kb/s	\$73* 20GB 512Kb/s	\$87* 10GB 1.5Mb/s	✓	✓	\$99 6mths	✓
IntegrityNet ADSL	1300 884 337	www.integritynet.com.au	\$29.95* 200MB 256Kb/s	\$59.95* 5GB 512Kb/s	\$69.95* 10GB 512Kb/s	\$99.95* 10GB 1.5Mb/s	✓	✓	\$139 12mths	✓
Internode Home ADSL	13 66 33	www.internode.on.net	\$29.95 500MB 256Kb/s	\$39.95 8GB 512Kb/s	\$69.95 40GB 512Kb/s	\$59.95 10GB 1.5Mb/s	✓	✓	\$129 6mths	✓
Internode SOHO ADSL	13 66 33	www.internode.on.net	N/A	\$59.95 10GB 512Kb/s	\$69.95 20GB 512Kb/s	\$79.95 10GB 1.5Mb/s	✓	✓	\$129 6mths	✓
Interwerks ADSL	1300 720 207	www.interwerks.net.au	\$34.95* 1GB 256Kb/s	\$49.95* 5GB 512Kb/s	\$79.95 No limit 512Kb/s	\$99.95* 25GB 1.5Mb/s	✓	✓	\$119 3mths	✓
iSage Internet ADSL	1300 725 789	www.isage.aunz.net	\$34.95 15GB 256Kb/s	\$44.95 25GB 512Kb/s	\$44.95 25GB 512Kb/s	\$76.95† 15GB 8Mb/s	✓	✓	\$99 6mths	✓
Ispace ADSL	1800 264 246	www.ispace.net.au	\$29.95* 200MB 256Kb/s	\$49.95 5GB 512Kb/s	\$69.95 35GB 512Kb/s	\$89.95 15GB 1.5Mb/s	✓	✓	\$120 6mths	✓
ITEL ADSL	13 36 36	www.itel.net	\$29.95* 200MB 256Kb/s	\$45.95* 1GB 512Kb/s	\$69.95 No limit 512Kb/s	\$89.95* 10GB 1.5Mb/s	✓	✓	\$129 12mths	✓
ADSL Broadband	1300 663 484	www.itginternet.net.au	\$31.79* 200MB 256Kb/s	\$54.89 5GB 512Kb/s	\$59.90 50GB 512Kb/s	\$79.90 15GB 1.5Mb/s	✓	✓	\$95 6mths	✓
JaziNET ADSL	1300 852 949	www.jazi.net	N/A	\$46.50 25GB 512Kb/s	\$46.50 25GB 512Kb/s	\$88 35GB 1.5Mb/s	✓	✓	\$110 1mth	✓
Jump Internet ADSL	1300 785 867	http://jumpnet.com.au	\$30* 200MB 256Kb/s	\$50* 2GB 512Kb/s	\$80 40GB 512Kb/s	N/A	✓	✗	\$0 12mths	✓
Koala ADSL	1300 720 109	www.koalatelecom.com.au	\$29.95† 500MB 256Kb/s	\$39.95† 3GB 512Kb/s	\$79.95† No limit 512Kb/s	\$64.95† 10GB 1.5Mb/s	✓	✓	\$129.95 6mths	✓
Lets Go ADSL	1300 556 114	www.letsgo.com.au	N/A	\$59.95 30GB 512Kb/s	\$59.95 30GB 512Kb/s	\$99.95 30GB 1.5Mb/s	✓	✓	\$99 6mths	✓
Lizzy ADSL	1300 364 074	www.lizzy.com.au	\$16.95* 200MB 256Kb/s	\$39.95 2GB 512Kb/s	\$54.95 No limit 512Kb/s	\$94.95 No limit 1.5Mb/s	✓	✓	\$99 6mths	✓
Lucidity Communications ADSL	1300 768 146	www.lucidity.net.au	N/A	\$59.95† 25GB 512Kb/s	\$79.95† 35GB 1.5Mb/s	\$79.95† 35GB 1.5Mb/s	✓	✓	\$120 1mth	✓
Midcoast Internet DSL	1300 134 638	www.midcoast.com.au	\$28.50* 200MB^ 256Kb/s	N/A	\$71.50* 10GB^ 512Kb/s	\$98* 10GB^ 1.5Mb/s	✓	✓	\$99 6mths	✓
Netspace Home ADSL	13 14 56	www.netspace.net.au	\$29.95* 300MB 256Kb/s	\$39.95 1GB+ 512Kb/s	\$59.95 25GB+ 512Kb/s	\$79.95 20GB+ 1.5Mb/s	✓	✓	\$99 6mths	✓
Netspace SOHO ADSL	13 14 56	www.netspace.net.au	N/A	\$59.95 15GB 12Kb/s	\$59.95 15GB 512Kb/s	\$99.95 20GB 1.5Mb/s	✓	✓	\$99 6mths	✓
NetSpeed ADSL	13 16 76	www.netspeed.com.au	\$24.95* 200MB 256Kb/s	\$54.95* 15GB 512Kb/s	\$74.95* 30GB 512Kb/s	\$94.95* 30GB 1.5Mb/s	✓	\$2	\$139 6mths	✓
Optraweb ADSL	1300 785 954	www.optraweb.com.au	N/A	\$44.95 5GB 512Kb/s	\$74.95 60GB 512Kb/s	\$81.95 15GB 1.5Mb/s	✓	✓	\$129 6mths	✓
Optraweb Excess DSL	1300 785 954	www.optraweb.com.au	\$32.95* 2GB 256Kb/s	\$39.95* 2GB 512Kb/s	\$74.95* 60GB 512Kb/s	\$81.95* 15GB 1.5Mb/s	✓	✓	\$129 6mths	✓
Optraweb Bundle DSL	1300 785 954	www.optraweb.com.au	\$27.95† 2GB 256Kb/s	\$34.95† 2GB 512Kb/s	\$69.95† 60GB 512Kb/s	\$80.95† 15GB 1.5Mb/s	✓	✓	\$129 6mths	✓
OfForces Residential ADSL	1300 134 081	www.offorces.com	\$24.95* 200MB 256Kb/s	N/A	\$68.95 25GB 512Kb/s	\$89.95 35GB 1.5Mb/s	✓	✓	\$119 6mths	✓
Pacific Internet DSL	13 36 35	www.pacific.net.au	\$29.95* 250MB 256Kb/s	\$39.95 1GB 512Kb/s	\$54.95 No limit 512Kb/s	\$69.95† 10GB 1.5Mb/s	✓	✓	\$99 6mths	✓
Primus Flexible Broadband	1300 850 000	www.primus.com.au	\$24.95† 500MB 256Kb/s	\$34.95† 1GB 512Kb/s	\$69.95† 20GB 1.5Mb/s	\$59.95† 12GB 1.5Mb/s	✓	✓	\$118 1mth	✓
Quantum ADSL	1300 884 170	www.quantumtelecom.com.au	N/A	\$49.95† No limit 512Kb/s	\$49.95† No limit 512Kb/s	\$79.95† No limit 1.5Mb/s	✓	✓	\$140 1mth	✓
Quik Internet ADSL	1800 000 355	www.gc.quik.com.au	\$29.99* 200MB 256Kb/s	\$54.99 5GB 512Kb/s	\$74.99 No limit 512Kb/s	\$89.99 10GB 1.5Mb/s	✓	✓	\$120 6mths	✓
Rabbit Internet ADSL	1800 501 106	http://rabbit.com.au	\$27.95†* 200MB 256Kb/s	\$34.90† 1GB 512Kb/s	\$57† 30GB 512Kb/s	\$71.41† 10GB 1.5Mb/s	✓	✓	\$99 6mths	✓
Rapid Net ADSL	1300 724 677	www.rapidnet.com.au	\$34.95 500MB 256Kb/s	\$44.95 5GB 512Kb/s	\$49.95 15GB 512Kb/s	\$79.95 12GB 1.5Mb/s	✓	✓	\$109 6mths	✓
REEDS.NET Internet Services	1300 734 445	www.reeds.net.au	\$29.95* 300MB 256Kb/s	\$49 25GB 512Kb/s	\$49 25GB 512Kb/s	\$87 35GB 1.5Mb/s	✓	✓	\$125 6mths	✓
Saco Technology ADSL	1300 664 186	www.sacotech.com.au	N/A	\$45.95† 2GB 512Kb/s	\$75.95† 60GB 512Kb/s	\$89.95† 15GB 1.5Mb/s	✓	✓	\$129.95 6mths	✓
Simplifit ADSL	1300 746 754	www.simplifit.com.au	\$31 500MB 256Kb/s	\$47 5GB 512Kb/s	\$57 30GB 512Kb/s	\$87 10GB 1.5Mb/s	✓	✓	\$99 3mths	✓
Snowynet ADSL	1300 556 315	www.snowy.net.au	\$29.90* 200MB+ 256Kb/s	N/A	\$69.90 No limit 512Kb/s	\$99.90 No limit 1.5Mb/s	✓	✓	\$110 6mths	✓
Southern Cross Telco ADSL	1800 727 777	www.sctelco.com.au	\$29.95† 400MB 256Kb/s	\$39.95† 2GB 512Kb/s	\$79.95† 30GB 1.5Mb/s	\$79.95† 30GB 1.5Mb/s	✓	✓	\$99 6mths	✓
Spin Internet	1300 303 375	www.spin.net.au	\$19.99* 200MB 256Kb/s	\$39.99* 1GB+ 512Kb/s	\$79.99 No limit 512Kb/s	\$69.99* 15GB+ 1.5Mb/s	✓	✓	\$99 6mths	✓
Supernerd SuperDSL	1300 888 090	www.supernerd.com.au	\$24.95* 500MB 256Kb/s	\$44.95* 10GB 512Kb/s	\$59.95 No limit 512Kb/s	\$89.95* 30GB 1.5Mb/s	✓	✓	\$110 6mths	✓
TalkTODAY ADSL	1800 486 329	www.talktoday.com.au	\$29.95†* 200MB^ 256Kb/s	\$44.95†* 1GB^ 512Kb/s	\$69.95† 40GB^ 512Kb/s	\$74.95† 10GB^ 1.5Mb/s	✓	✗	\$119 6mths	✓
TeaAustralia SME & Res	1300 783 528	www.teaaustralia.com.au	N/A	\$49.95 25GB 512Kb/s	\$79.95 35GB 1.5Mb/s	\$79.95 35GB 1.5Mb/s	✓	✗	\$120 6mths	✓
Telstra BigPond ADSL	13 12 82	www.bigpond.com	\$29.95* 200MB^ 256Kb/s	N/A	\$69.95† 12GB^ 1.5Mb/s	\$69.95† 12GB^ 1.5Mb/s	✓	\$2.50	\$99 12mths	✓
Fat Free Broadband ADSL	1300 726 831	www.fatfreephones.com	N/A	\$49 25GB 512Kb/s	\$49 25GB 512Kb/s	\$89 35GB 1.5Mb/s	✓	✓	\$110 1mth	✓
TSN Broadband	13 14 86	www.tsnetinternet.com.au	\$29.95 No limit 256Kb/s	\$39.95 No limit 512Kb/s	\$39.95 No limit 512Kb/s	\$69.95 No limit 1.5Mb/s	✓	✓	\$129 6mths	✓
Velocity Internet ADSL	1300 557 300	www.velocitynet.com.au	\$29.95* 300MB 256Kb/s	\$49.50* 4GB 512Kb/s	\$79.50* 50GB 512Kb/s	\$89.50* 24GB 1.5Mb/s	✓	✓	\$69 6mths	✓
VitalTel ADSL Broadband	1300 858 706	www.vitaltel.com.au	\$23.95* 200MB 256Kb/s	\$48.95 10GB 512Kb/s	\$48.95 10GB 512Kb/s	\$68.95 10GB 1.5Mb/s	✓	✓	\$139.95 6mths	✓
Web Ace ADSL	1800 202 012	www.webace.com.au	\$19.95†* 200MB 256Kb/s	\$39.95† 2GB 512Kb/s	\$69.95 60GB 512Kb/s	\$84.95 15GB 1.5Mb/s	✓	✓	\$119 6mths	✓
Web-Hermits ADSL	1300 765 928	www.web-hermits.com	\$34.95 2GB 256Kb/s	\$41.95 2GB 512Kb/s	\$49.95 20GB 512Kb/s	\$81.95 20GB 1.5Mb/s	✓	✗	\$109 6mths	✓
Westnet Home ADSL	13 19 60	http://westnet.com.au	\$29.95† 500MB 256Kb/s	\$34.95† 1GB 512Kb/s	\$64.95† 25GB+ 512Kb/s	\$69.95† 10GB+ 1.5Mb/s	✓	\$0.83	\$99 6mths	✓
Wild IT DSL + Phone	1800 809 453	www.wilditdsl.com.au	\$31.95† 15GB 256Kb/s	\$39.95† 25GB 512Kb/s	\$64.95† No limit 512Kb/s	\$69.95† 35GB 1.5Mb/s	✓	✓	\$98 1mth	✓
Wild IT Budget DSL + Phone	1800 809 453	www.wilditdsl.com.au	\$28.95†* 5GB 256Kb/s	\$34.95†* 10GB 512Kb/s	\$64.95†* 20GB 1.5Mb/s	\$64.95†* 20GB 1.5Mb/s	✓	✓	\$138 1mth	✓
Winshop ADSL	1300 137 772	www.winshop.com.au	\$29.95 500MB 256Kb/s	\$49.95 5GB 512Kb/s	\$59.95 10GB 512Kb/s	\$79.95 10GB 1.5Mb/s	✓	✓	\$139 12mths	✓
Yak Networks ADSL	1300 784 866	www.yak.com.au	N/A	\$54.95 25GB 512Kb/s	\$54.95 25GB 512Kb/s	\$87.95 35GB 1.5Mb/s	✓	✓	\$119 1mth	✓
Yaussie Net ADSL	1300 883 352	www.yaussie.com.au	\$31.95† 15GB 256Kb/s	\$39.95† 25GB 512Kb/s	\$64.95† 100GB 512Kb/s	\$69.95† 35GB 1.5Mb/s	✓	✓	\$98 1mth	✓
yourhub ADSL	1300 762 568	www.yourhub.com.au	N/A	\$55 1.5GB 512Kb/s	\$80 15GB 512Kb/s	\$95 10GB 1.5Mb/s	✓	\$1	\$110 12mths	✓
ZCTS ADSL	1300 852 949	www.zcts.net	N/A	\$46.50 25GB 512Kb/s	\$46.50 25GB 512Kb/s	\$88 35GB 1.5Mb/s	✓	✓	\$110 1mth	✓

Key: * ISP charges excess usage fees when you exceed your download limit. † This price only available if bundled with long distance telephony from the ISP. ^ Additional download allowance available with this plan for use in off-peak periods; ^ ISP combines sent and received data when calculating usage. # Minimum BigPond Cable setup fee is based on 12-month contract with modem included. Telstra does not offer a BYO modem option.



Building a multi-terabyte HD

Nathan Davis explains the gains that will be achieved with perpendicular magnetic recording technology.

We all have a growing need for more storage space; but with current technology, hard drive storage capacity has reached its limit and there's no raising the roof.

Basically, hard drives are running out of physical space in which to store the physical representation of ones and zeroes: the bits. Luckily, although the density of data has hit its hard limit with the current technology, a relatively new method called perpendicular magnetic recording is already solving this problem.

To help explain what exactly this wonderful new technology is, let's first take a peek at the interesting world of how data is actually stored on most ordinary hard drives —

those that don't use this fancy new form of storage.

As you're probably aware, all hard drives contain at least one platter, the rotating glass or aluminium disk of a hard drive. Most hard drives have several of these. The platters themselves are non-magnetic; but, they are each thinly coated with a film of magnetic material that makes their surfaces perfect for storing data.

This magnetic surface is mapped-out into orderly sections so as to easily address, access and alter the stored data bits. These include concentric tracks that circle a platter, and sectors, which are tracks that have been divided into smaller sections.

Each of these sectors usually stores 512 bytes of information — or 4,096 minuscule bits.

The magnetic surface material consists of extremely tiny magnetic grains. In order to store one tiny bit of data, the read-write head magnetises several hundred of these grains at once, which, in turn, create their own tiny magnetic field with a north and south pole. The direction to which this field faces on the platter (either away from or toward the head) dictates whether the stored bit represents a one or a zero.

This very clever method is known as longitudinal magnetic recording and is named as such due to all magnetic poles lying adjacent

to the platter. This storage method is very old and has been in use since the first hard drives in the late 1950s.

As old and trustworthy as it may be, this technology is exactly what needs changing in order to create higher-capacity hard drives. Why? Basically, it's a catch 22.

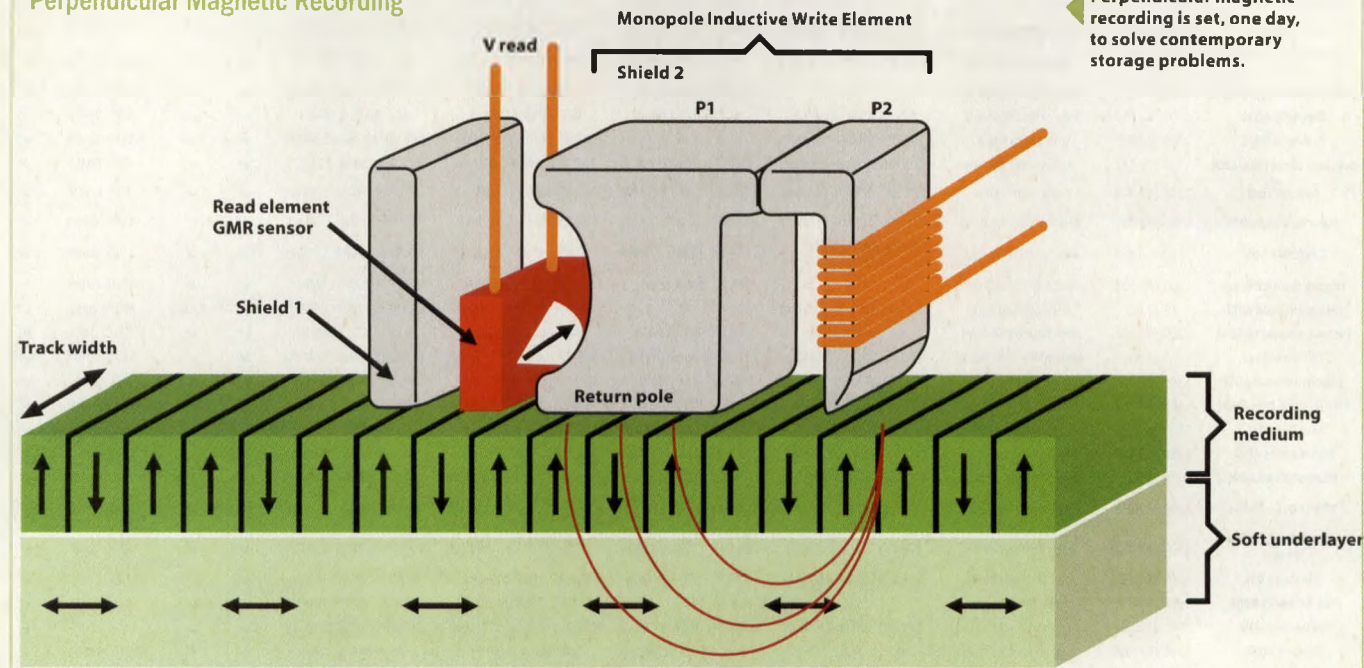
On one hand, you need a minimum amount of magnetic grains in order to create a magnetic field strong enough to withstand a strange magnetic phenomenon called superparamagnetism. According to Hitachi, in order to reliably store information, you need at least about 100 grains due to the irregular sizes and shapes. These grains also have a minimum size.

If you go below on either factor, the poles may spontaneously reverse or lose their magnetism due to being excited by fluctuations in temperature — even just at room temperature. This, of course, directly contributes to data loss.



ASIDE FROM INCREASED STORAGE SPACE, ANOTHER ADVANTAGE IN INCREASING AREAL DENSITY IS FASTER ACCESS TIMES

Perpendicular Magnetic Recording



On the other hand, however, in order to create higher-capacity hard drives within the same area, you need to continually reduce the storage area required per bit — also known as increasing areal density.

This is where perpendicular magnetic recording comes into play and it avoids the desire to decrease the grain count or size by aligning the magnetism in a much different manner.

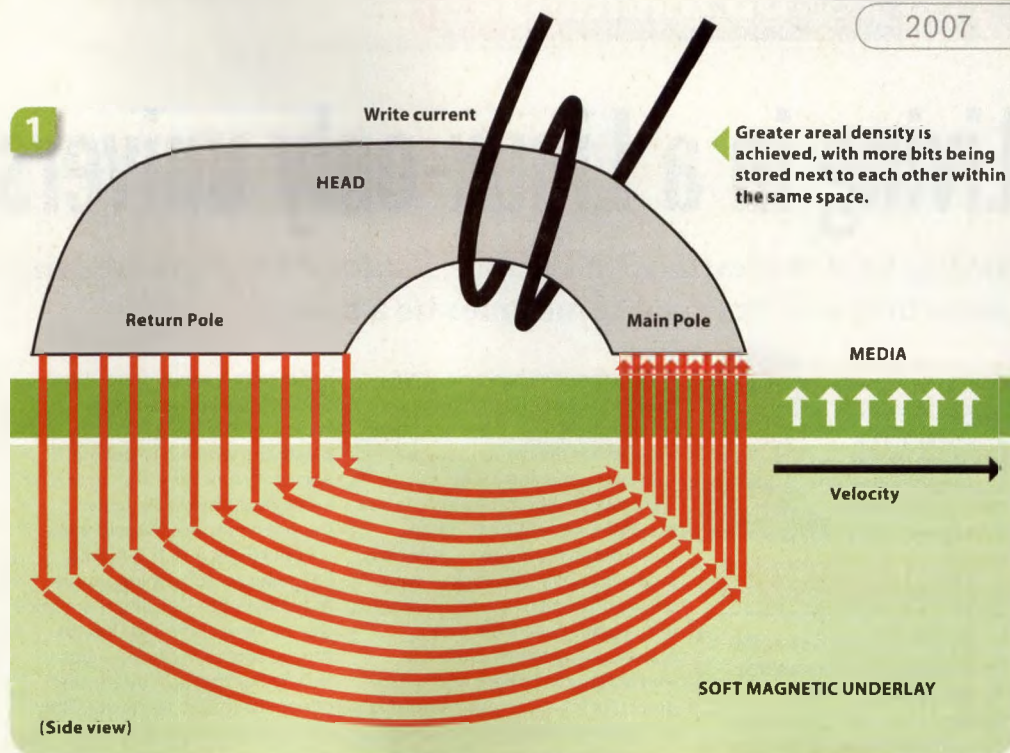
Unlike longitudinal recording, perpendicular drives use platters that have a soft magnetic layer that sits under the actual recording layer. This top recording layer aligns the poles of the magnetic material perpendicular to the platter rather than longitudinally. Basically, the magnetic fields are standing up rather than lying down on the platter.

① As a result, a significantly greater areal density is achieved, as more bits can be stored next to each other within the same space.

The soft magnetic underlay is an efficient magnetic flux conductor. As such, to alter a bit, the main writing pole on the head focuses an intense magnetic field between it and the soft magnetic under-layer. The under-layer conducts the flux under and back up through the recording layer — which is now less focused, so it has no ill effect on the data through which it passes — to the return pole on the head, completing the magnetic field and successfully writing the bit.

This layout means stronger magnetic materials can be used with the benefit of a more reliable state of magnetisation — so, more reliable data storage. The soft underlay also strengthens the magnetic signal when being read, so interference from adjacent tracks is much less of a problem. Using perpendicular recording, a platter

On the left, longitudinal storage. On the right, perpendicular storage, with the magnetic underlay showing.



can store up to ten times the amount of data as a longitudinal drive. In terms of comparative areal density, longitudinal drives currently sit roughly around 100-150 gigabits per square inch (Gbit/si).

Perpendicular's current theoretical limit is one terabit per square inch (Tbit/si), or 1,000

Gbit/si, with Seagate recently announcing it has managed to create a world record areal density of 421Gbit/si. It says 2.5TB drives will make use of this areal density as early as 2009.

What may come as a surprise is that this perpendicular method isn't a new idea. In fact, there were plans to implement the technology

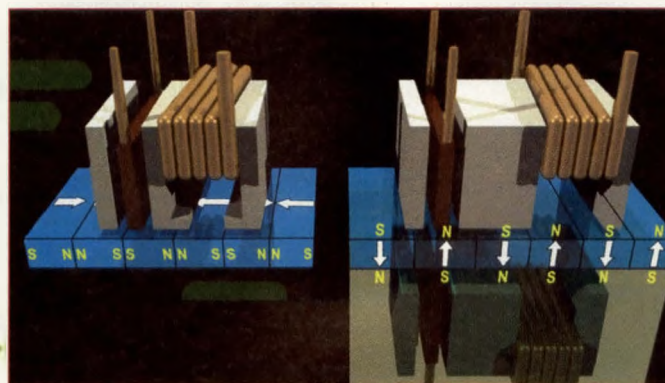
on floppy diskettes back in the 1980s; however, that failed, as they weren't reliable enough for widespread use.

Aside from increased storage space, another advantage in increasing areal density — and moving to perpendicular recording — is faster access time. On a high-areal density drive, for the same mechanical movements as a less-dense drive, more data can be accessed by the read-write head. This can also, at least in theory, save on power.

There are drives currently available that use perpendicular recording technology, such as all 750GB desktop 3.5in hard drives and several aimed at the mobile arena. Hitachi plans to release its first terabyte hard drive in the first quarter of 2007, with an areal density of around 170Gbit/si.

In the mobile sector, there are several 2.5in 160GB notebook hard drives based on perpendicular technology in the form of Hitachi's Travelstar 5K160, Seagate's Momentus, and Western Digital's Scorpio unit.

Thanks to perpendicular recording, there's obviously a whole lot of juice to be squeezed out of the platter-based hard drive yet. It would seem that one of the few remaining mechanical components of the computer will be sticking around with us for the long term. **ETC**



Source: Seagate.

DRIVEN TO THE FUTURE

Although not expected to be used for several years, Dr William Cain of Western Digital tells us that "Heat-Assisted Magnetic Recording" is expected to further increase the areal density of the mechanical hard drive. Here, the read-write head will use heat from a laser to produce thermally-stable data on the recording layer. He also

mentioned "patterned media", an intriguing technology where the platter's surface has physical patterns that aim to better define the properties of the bits.

In terms of future areal densities, Dr Kryder of Seagate says that he expects to see 50Tbit/si "and beyond," although no date was mentioned. Hitachi also

recently jumped in the same boat, however, with an ambiguous date, declaring that beyond 2016 we'll see areal densities of 100Tbit/si. Two 3.5in drives featuring that technology will give you a monstrous 1.3 petabytes (or 1,300 terabytes).

Don't hold your breath for these. It'll hurt.

Living in a Linux-only universe, part 5

Having now settled in with Ubuntu, *Ashton Mills* discovers that living in a Linux-only universe can sometimes be a breeze...

ASHTON MILLS

Ashton has been a tech journo for over 12 years, including five years with APC.



THE RATINGS

In this project we're making the assumption that Windows does all that we need — and we're seeing if Linux and open source software measures up. Perhaps that's not an entirely fair place to sit; however, as the de facto in operating systems for which everyone is familiar, it's our best basis for comparison. So here's how we'll rate the experience of going Windows-free:

OPTIMAL

Passes with flying colours. The task could not only be completed, but better or easier than under Windows.



PASS

No problems. The task can be completed exactly as under Windows.



IFFY

When a task could only be partially completed or completed but not without issue.



FLOP

Not possible to complete at all. (Probably not a good thing.)



So far we've had a bit of hit-and-miss affair in the Open Source Challenge. There have been a few issues that weren't so much something missing in Linux or its applications, but more a simple lack of polish or attention to detail. Some of the problems — especially media and DVD playback — were solved through help on the Ubuntu forums, but aside from these, features need to be bundled in. And if they can't, there needs to be great big, fat information pop-ups when these features are accessed that tell you why they're missing, and the shortest click-through steps to get them working. Searching a forum does not come under the umbrella of "ease of use", a trophy Ubuntu has long been striving for. In fact, the user shouldn't have to search for anything. For an operating system to be easy to use — and this applies equally to Linux, Windows, and Skynet (which we all know is being developed in some secret US bunker) — it has to work for you,

not the other way around. If you trace the challenge so far, you'd be fooled into thinking I was Ubuntu's plaything, working to get the necessary functionality out of it. Somewhat opposable to its intended purpose, I would think.

But I digress — this month, I'm going for something simple. Actually, I've been using them since the moment I installed Ubuntu — they're core to my work — but they're not the most interesting of applications to start with. They are however essential: email and office apps, the cornerstones of any networkable business machine.



EVOLUTIONARY EMAIL

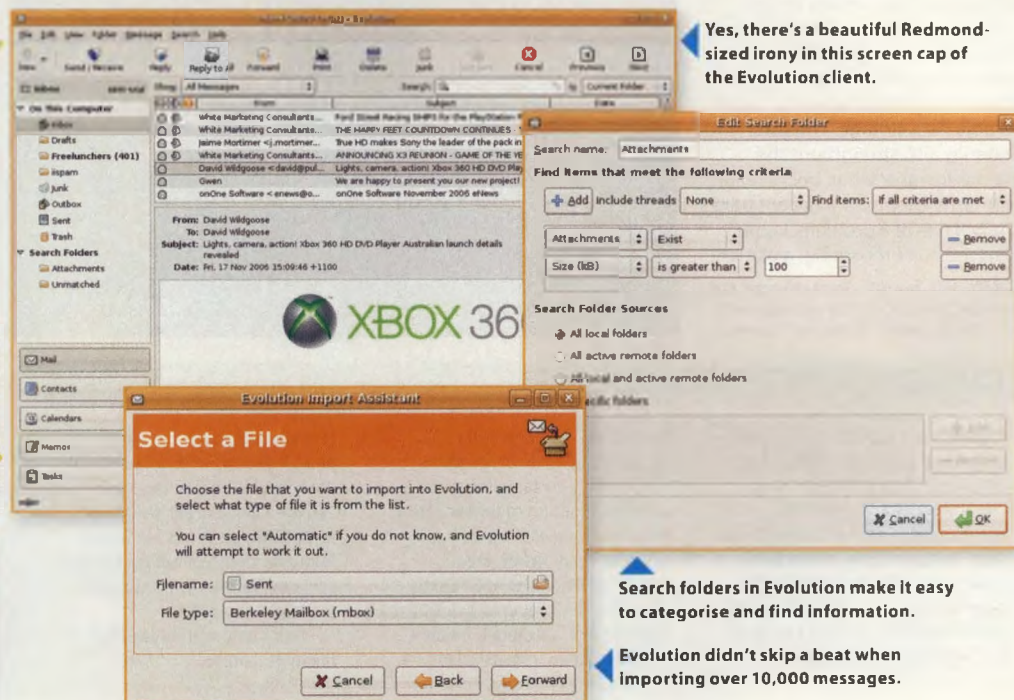
One of the most popular software suites that put GNOME on the map a few years ago for "business" computing was Evolution, an open source alternative to Outlook with a focus on the office. Not just an email client, but calendar, contact

database and task manager, it was designed to be the ultimate Linux groupware suite. Except that, for a long time, its uptake was limited because it couldn't interface with MS Exchange servers for email without a costly commercial plug-in from Ximian (now free).

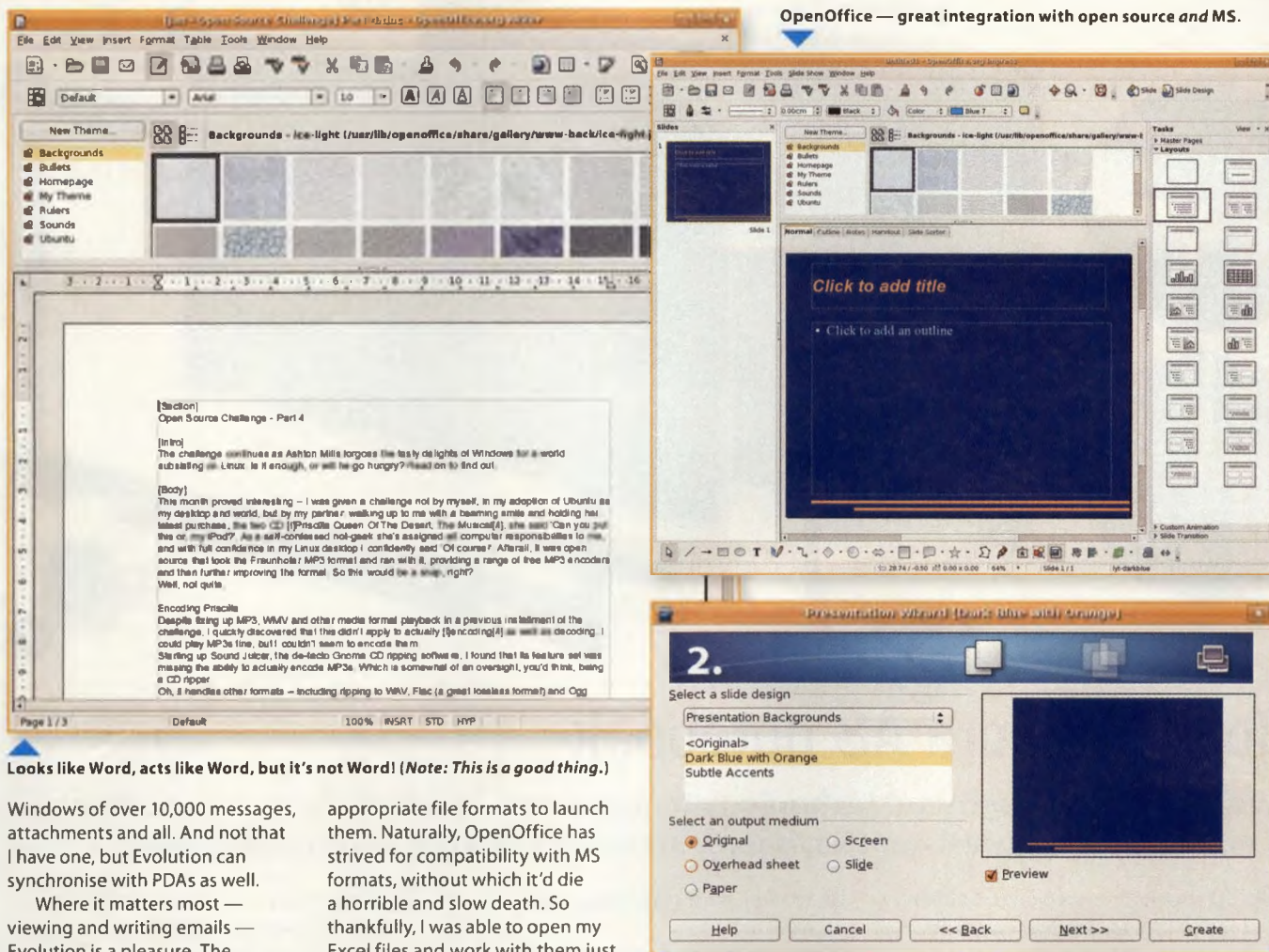
Today, Evolution is the default email application for GNOME, and is pretty damn swank. It's not as lean as alternatives such as Thunderbird or Slyphed, but it lacks nothing, and its contact, calendar and task-list integration is essential.

Having been using it for a while now, I do somewhat miss the simplicity of a leaner client like Outlook Express or Thunderbird, but probably more due to familiarity (having used both extensively) than anything else.

Otherwise, Evolution is simply a powerhouse. Filters are a breeze to set up, GPG support is built in, neat features like Search Folders make it easy to find information — and it didn't blink when importing my inbox from Thunderbird under



OpenOffice — great integration with open source and MS.



Looks like Word, acts like Word, but it's not Word! (Note: This is a good thing.)

Windows of over 10,000 messages, attachments and all. And not that I have one, but Evolution can synchronise with PDAs as well.

Where it matters most — viewing and writing emails — Evolution is a pleasure. The formatting options in the editor are great; how it handles attachments is simply beautiful; and if you can't be bothered to write a signature, it'll auto-generate one for you. My only bugbear is the annoying shaded bars for every second line in the messages box; a bit of Gnome standard which can't be turned off. What's wrong with a plain white background? Can't have everything, I suppose. But still, Evolution comes close.



OPENOFFICE

Much like Evolution has had many years of development behind it, so too has

OpenOffice, Ubuntu's chosen office suite. In fact, OpenOffice has quite a following, not only under Linux, but in Windows as well.

Ubuntu installs the OpenOffice Database, Spreadsheet, Presentation and Word processing components and registers the

appropriate file formats to launch them. Naturally, OpenOffice has strived for compatibility with MS formats, without which it'd die a horrible and slow death. So thankfully, I was able to open my Excel files and work with them just as under Windows. In fact, aside from some interface and functionality changes OpenOffice brings to the table, Spreadsheet looks and works the same as Excel, right down to editing functions.

Similarly, Word documents opened fine, with maybe a differentiation in font at times, but otherwise everything was present. In fact OpenOffice's format support is massive, going back to WinWord 5 and, more importantly, can write to a variety of MS formats (along with everything else) including Word 6, 95 and 2000/XP (for when you're sending documents to those who have resisted the upgrade urge). You can even export as a PDF (a feature which applies to all OpenOffice applications).

What's strange for me is that I don't particularly find office software very interesting. As long as it does what I need, I generally ignore the superfluous features. But, I've been impressed

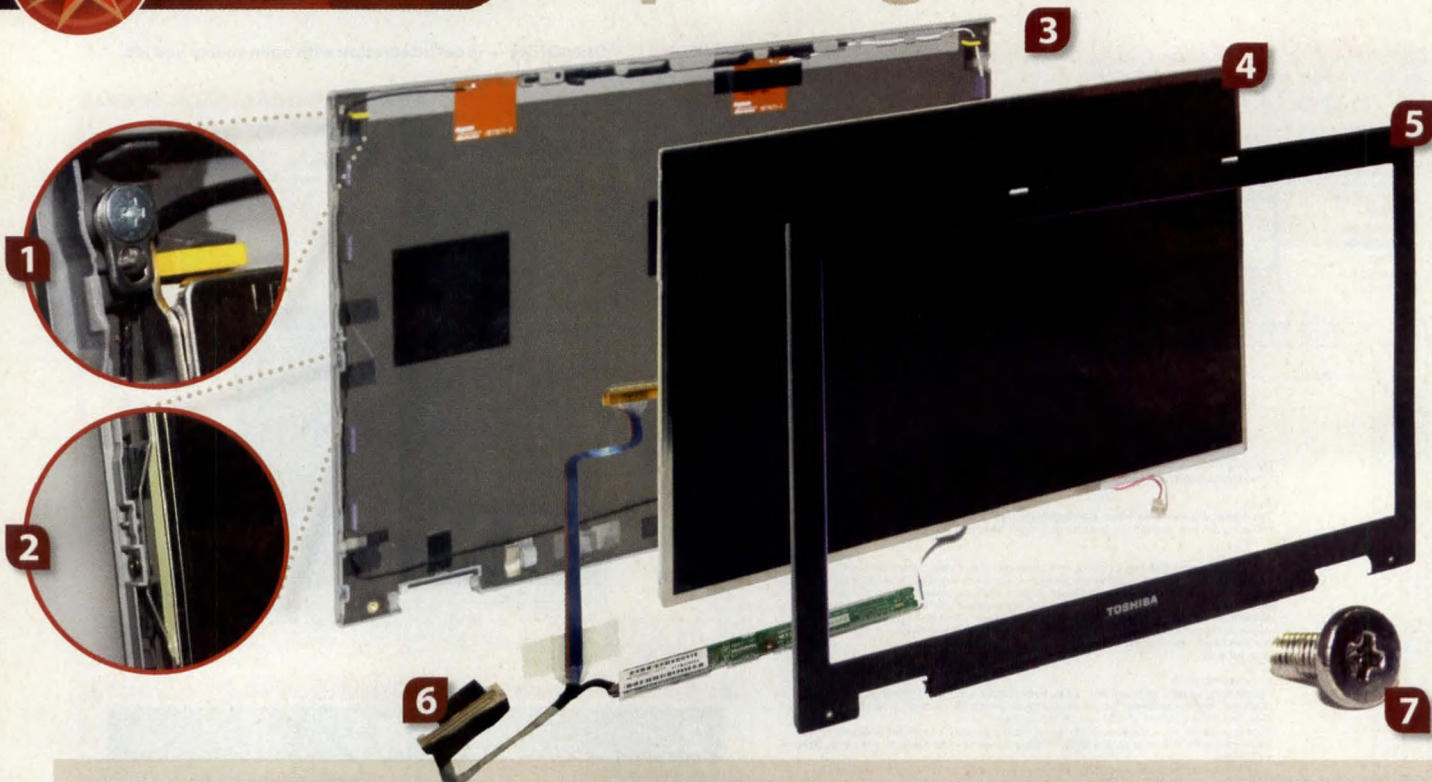
Presentation — functionality and workflow is easy to get to grips with.

with OpenOffice's integration with other OS components, such as databases (working with Evolution), a media player (not pulled from Gnome, however) and a litany of tools and options in the menus, most of which I have no clue how to use (but nice to know they're there). In this regard, it's a very faithful emulation of MS Word.

Truth be told, I don't write in Word under either OS. A simple text editor like Notepad (Windows) or Gedit (Linux) is enough. I don't need to deal with formatting, letterheads, image integration and all the rest. If I did, I don't think I'd miss anything using OpenOffice. I'm sure the office aficionados would be able to fault MS or OO's suite one way or another, but for me it's been doing everything I've needed it to, which is about as high a praise as I can give in this

Challenge — if it works as I expect it to, then it makes me a happy user, and that's entirely the goal of an OS.

I knew going in that email and office would be two areas to excel (ahem) under Linux, and that I would be able to work with both trouble free — there's a long history and years of development behind them. Perhaps it's also saying something that both OpenOffice and Evolution are modelled off their Microsoft equivalents (and drastically improved upon in some aspects), being both easy to use and familiar to the Windows experience. Which, in a twisted irony, is what also makes them successful for Linux, and as the very alternative to Windows at that. I think my head hurts now, I'll leave it at that. Next month: games, cameras and fun things to do with images. **OUT**



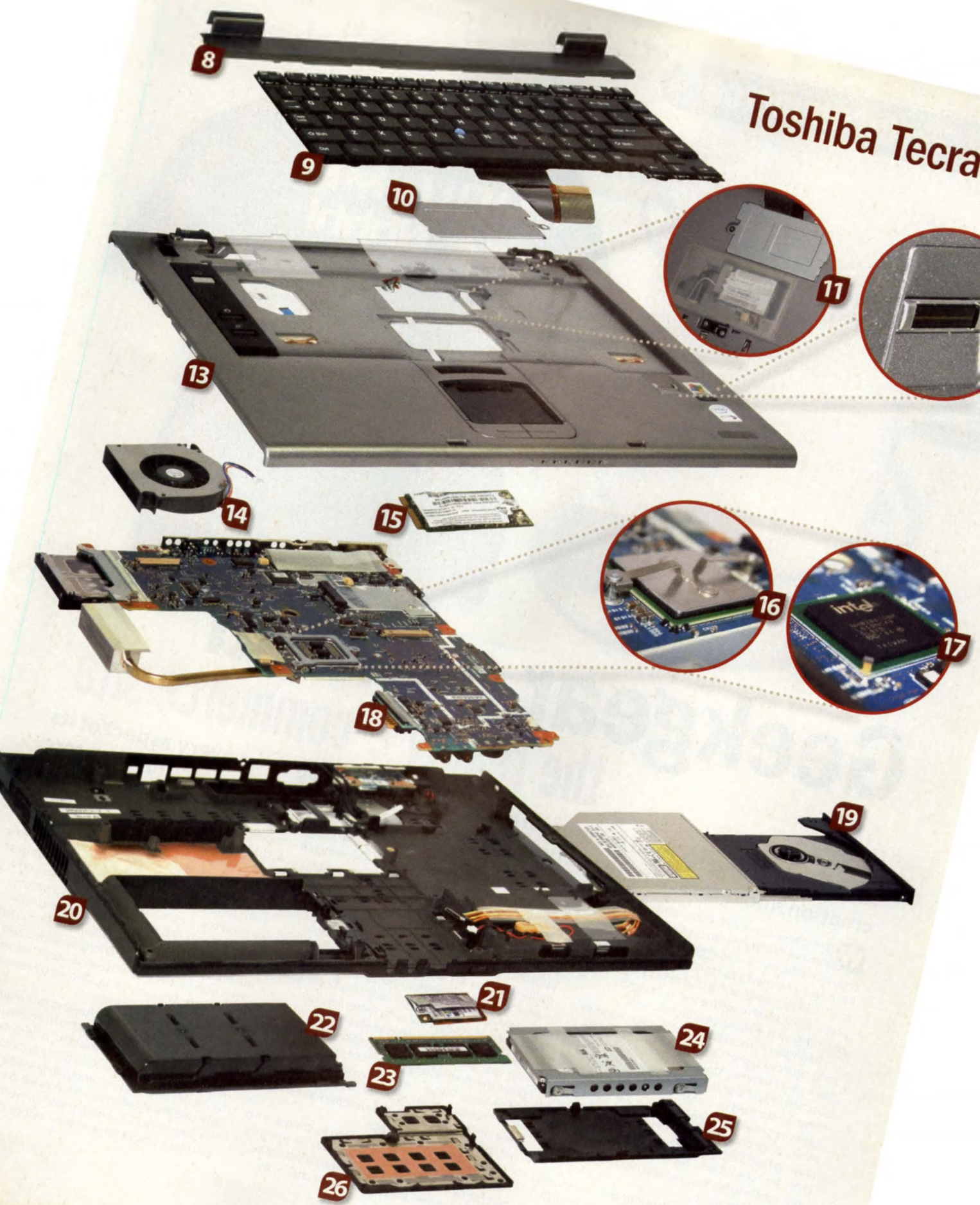
Toshiba Tecra A8 notebook

We look at the EasyGuard technology that protects Toshiba's Tecra A8 notebook. This includes spill-resistant keyboard, 3D accelerometer and crumple zones.

- 1 LCD screen is screwed onto mounting bracket (not external case) for extra protection. Yellow pads provide cushioning against shocks.
- 2 LCD mounting bracket with leaf spring to give flexibility and prevent screen damage.
- 3 LCD casing with wireless networking antenna (white cable).
- 4 15.4in TFT Active Matrix wide-screen XGA (1,280 x 800 resolution). Rests on cushioning pads to prevent damage.
- 5 LCD housing.
- 6 FL inverter and LCD control board. Provides high voltage to drive the fluorescent tube in the LCD screen. Blue/red cables carry data to screen.
- 7 Lock tight screws. Screws into brass inserts, not plastic, for added strength. All screw holes on casework labelled for easy repair.
- 8 Casing.
- 9 Spill-resistant keyboard.
- 10 Spill resistant cover for wireless / keyboard support plate.
- 11 Spill-resistant covers protecting Wi-Fi unit.
- 12 Biometric security with advanced fingerprint sensor with Toshiba Fingerprint Utility.
- 13 Casing.
- 14 System fan.
- 15 Integrated Intel 3945 ABG PRO/Wireless 802.11a/b/g.
- 16 CPU Northbridge with heat sink, and support bracket to keep chip firm on motherboard.
- 17 Mobile Intel Core Duo T2400 Processor (dual-core 1.83GHz, 667 FSB, 2MB L2 cache). Mobile Intel 945GM Express Chipset.
- 18 Single motherboard for easier repair. PCB has added thickness for strength. Cooling pipe removes heat.
- 19 DVD SuperMulti Dual / Double Layer (DVD±R±RW, DVD±R(DL) DVD-RAM).
- 20 Crumple zones between edge of circuit board and inside of casing help protect motherboard in case of severe impact.
- 21 Modem.
- 22 Primary battery — 6 cell x 4,400mAh Lithium-Ion battery (up to four hours depending on usage).
- 23 RAM 512MB DDR2 expandable to 4GBs (one slot used, one slot free).
- 24 Hard drive 80GB (5,400rpm) capacity SATA. Hard drive mounted on four cushions for shock protection. 3D accelerometer on motherboard detects sudden motion and docks drive head to protect when notebook is dropped.
- 25 Raised HDD dome to prevent damage to hard drive internals while disc is spinning.
- 26 Access panel to modem and RAM.



Toshiba Tecra





Geekgear.com.au

the reality e-commerce site

APC is launching its own e-commerce site and letting you in on every aspect of its creation and operation. Tony Sarno looks at the selection of products for the store.

We're going to sell APC merchandise to show you how an online store works: we've registered the name Geekgear.com.au. Plus, we have an e-commerce partner (to provide advice and build the store) and a payments system in place. We're now ready for the exciting bit: deciding on the actual products to sell.

Geekgear.com.au will sell APC merchandise ranging from T-shirts to unusual gadgets. Talk to any e-commerce store owner trying to succeed online and they'll tell you the same thing: to succeed in e-commerce, a business needs to provide online shoppers with unique value, since online puts you in a brutally flat playing field without many of the barriers to entry for competitors (which help support bricks and mortar businesses), such as geographic location.

An online store is competing with hundreds of similar businesses around the world, so it all comes down to the value of the offer and any subsequent marketing behind it.

According to Luke Amery, our consultant from NetMerchant, the Sydney-based e-commerce provider advising APC on this project, there are two main value types offered by online business: pricing, or provision of niche or unique products.

We'll stay away from a cut-throat pricing approach. This is actually followed by many online businesses, says Amery who advises "It's easier to sell on niche than on no margin or next to no margin." Amery says many small operators enter a market segment with extremely low prices, trying to put everyone else out of business. "But what they don't take into account is that there will always be lots of others trying to do the same thing." Even if we wanted to sell our T-shirts and gadgets on price, we simply don't have the connections with suppliers in Asia to get the gear cheap enough.

So, Geekgear.com.au is going to compete on added value rather than pricing. We're going to put funny slogans on T-shirts and select some unusual gadgets that appeal to us and — by

extension — our readers. We also want to play to our strengths as wordsmiths rather than actual creators of physical products.

We decided on our slogans in various discussions on the magazine. We did a quick tour of the web to see who else was selling geek gear with slogans and, like any business eyeing off a competitor, we decided we could do a better job. The slogans needed to be witty and make a statement about the buyers. Our target market, our readers, tend to be technically skilled and often take on the role of "tech support" for their social circle. We thought this would be fertile ground for T-shirt humour.

The APC staff got together and threw around ideas. The one slogan we had to have was: "No, I won't be your free Tech Support", the universal lament of anyone who is regularly approached by friends and acquaintances to provide them with unofficial tech support. A variation of this is "Fix your own PC!" Another slogan we liked was "Of course you've never visited a porn site."

GEEK GEAR

CATEGORY	ITEM	PROJECTED SALES	SALES REVENUE (INC. GST)	GROSS PROFIT	TAX (GST)	NET PROFIT
T-SHIRTS	Small	10	\$249.48	\$169.48	\$22.68	\$146.80
	Medium	10	\$249.50	\$164.50	\$22.68	\$141.82
	Large	10	\$249.50	\$159.50	\$22.68	\$136.82
	X-Large	10	\$249.50	\$154.50	\$22.68	\$131.82
	XX-Large	10	\$249.50	\$149.50	\$22.68	\$126.82
CAPS	Standard cap	10	\$149.50	\$109.50	\$13.59	\$95.91
	Beanie	10	\$149.50	\$109.50	\$13.59	\$95.91
GADGETS	USB Flex Light	10	\$220.00	\$120.00	\$20.00	\$100.00
	Geek Cup	10	\$110.00	\$60.00	\$10.00	\$50.00
	LED Binary Clock	10	\$275.00	\$150.00	\$25.00	\$125.00
	Geek Back Pack	10	\$550.00	\$300.00	\$50.00	\$250.00
	Mouse Mats	10	\$110.00	\$60.00	\$10.00	\$50.00
	APC Wi-Fi Detector	10	\$440.00	\$240.00	\$40.00	\$200.00
	APC Spectrum Analyser	10	\$330.00	\$180.00	\$30.00	\$150.00
	APC MP3 Player	10	\$737.00	\$402.00	\$67.00	\$335.00
	APC USB Cup Warmer	10	\$220.00	\$120.00	\$20.00	\$100.00
	TOTALS:	160	\$4,538.48	\$2,648.48	\$412.59	\$2,235.89

Note: These figures may change for launch.

This slogan is really based on the many contributions to our End User column in which readers asked to rid computers of malware find telltale traces of porno site visits — and have the PC's owners claim they would never do such a thing.

We're mostly blokes here on the mag, save for our chief sub-editor, Melanie Farr. As our resident non-geek and the smallest member of staff, she was probably having a go at some of us with her suggested slogan: "Geeks aren't always XXL." Still, I thought that T-shirt might sell well to women, so we've included the slogan on the shortlist.

Techie stereotypes in popular culture almost always include sniggering references to geeks' obsession with computers at the expense of their love lives. We felt that computer terminology can be harnessed to prove the opposite: that techies are, in fact, virile and witty.

Our art director, Chris Zammit coined this beauty: "You + Me = 2.0ooooohh". If that doesn't melt the heart of any member of the opposite sex, I don't know what will. We also liked "I'm a



SELLING GEAR ONLINE IS AN ONGOING PROCESS OF DISCOVERY ABOUT WHAT USERS WANT (AND WHAT STOCK TO HOLD)

computersexual," which says it all, doesn't it? If "metrosexual" can describe a few men like Ian Thorpe or David Beckham, "computersexual" would certainly describe a bigger demographic. We'll unveil our final T-shirt slogans when the site actually goes live in the next issue.

We picked the supplier of the T-shirts, Gildan, a North American company, ahead of any low-cost Asian-based or local suppliers. We surveyed some other e-commerce businesses selling clothing and they recommended this company. Basically, we wanted high-quality T-shirts to carry our brand, and Gildan's gear fitted the bill. The T-shirts are made from high-quality North American cotton and manufactured without seams for that little touch of class. They were also available to us at the right price.

We're also going to sell some unusual gadgets that we think readers will just have to have.

One is a USB-powered coffee cup warmer: a little hotplate that sucks out enough power from your PC to keep your coffee warm, a necessity when you're going to be up all night doing that PowerPoint presentation (or for a coding job on deadline). We're also aiming to sell a USB light for notebooks, for when you're in bed with your partners asleep and you just can't see the keys in the dark. It should open up many more hours of potential web surfing for APC readers! As well, we've found other essentials, such as a Geek backpack with an iPod connection, and a Wi-Fi Detector and Spectrum Analyser for finding free access and other services when away from your standard net connection.

The big decision at this point, and we mean the big one, is how much stock we purchase and

hold for launch. If we get the prediction wrong, we're going to have some expensive ballast on our hands. Our basic plan (see table above) shows we're going to spend around \$4,500 to hold about ten items in each product line when the online store launches. That will be our maximum exposure in terms of stock (not mentioning site costs, to be covered more extensively later).

Selling gear online is really an ongoing process of discovery about what users want, and of constantly hedging your bets on what stock to hold. Amery says we'll know which products are selling very soon after launch. We'll then purchase more of that stock and put the products that are languishing on special.

If a business is going to be selling hundreds of products, the business plan will need to reflect the complexity of the operation. In our case, Geekgear.com.au is about demonstrating the principles of e-commerce, so our financial plan (see table) is modest, based on making a couple of thousand dollar's profit to cover some of the costs of doing this.

The cost of purchasing each T-shirt and emblazoning it with a slogan will be \$10, and we'll aim to sell it for \$24.95. If we purchase ten T-shirts each in five of the standard sizes and manage to sell them all, we'll make a profit of \$684.70 after GST. As you can see from the table, once we include the gadgets, we're aiming for this enterprise to make a net profit of \$2,235.89.

Well, this is the rough plan. Next month: we'll have a proper P&L for our business; we'll discuss the process for dealing with the suppliers and securing the stock; and we'll actually launch geekgear.com.au. 

THE GEEKGEAR.COM.AU SERIES

- Getting started
- Product planning
- Web site development and launch
- Online marketing — search engine optimisation
- Web site design and launch
- Back-end processing — freight, holding stock, payment processing etc.
- How the store fared

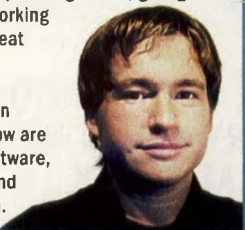


Outlook greetings machine

If you've got the recall powers of a goldfish, you can still be sure to cover all those important birthdays in style. *David Emberton* explains.

DAVID EMBERTON

David Emberton got his start as a bored IT trainee, posting free programming tutorials online when nobody was looking. Out of that, he has ended up writing books, giving talks and working for some great companies worldwide. David's main interests now are internet software, creativity and geek health.



SKILL LEVEL

● Beginner

TIME TO COMPLETE

● One to two hours

REQUIREMENTS

● Microsoft Outlook 2003;
K'Alert 1.1; .NET Framework 1.1

INSIDE INFO

- Konnech K'Alert
www.kalert.com
- SMS Pup
www.smspup.com.au
- Fast Connec
www.fastconnect.net.au
- Stock.xchg
www.sxc.hu

The great thing about computers is that they never forget, unlike those of us who need help remembering even basic things like birthdays and anniversaries. There are several services available online that can send ecards to people on your behalf, but the greetings themselves tend to be a bit tacky and ad-laden — and those web sites also require a lot of personal information. Therefore, we've come up with a more private solution that combines Microsoft Outlook, email and your mobile phone to get the same effect.

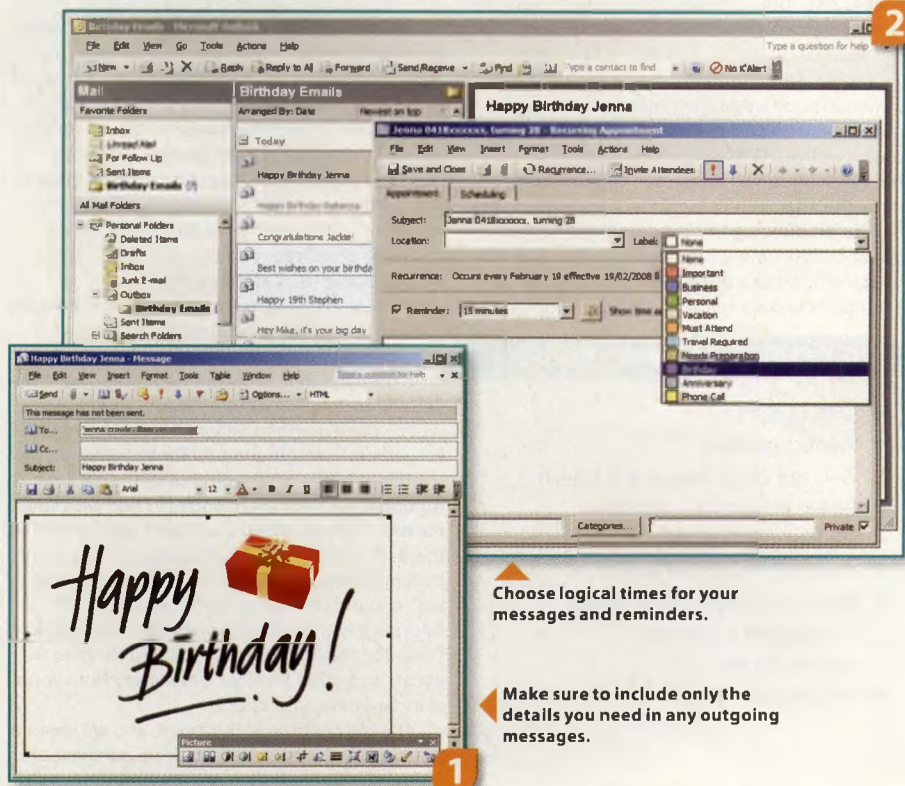
The basic idea here is to create all your birthday and other similar emails in advance, and let Outlook send them for you automatically at a specified date and time. For the personal touch, a desktop alert and/or SMS text message is also part of the system, so you can be reminded to call and follow-up within a few hours of each email being delivered. The person's name, number and possibly even their

age are given to you as needed. It's the gift of electrons: you wouldn't send one to your girlfriend, but ecards can be nevertheless be a great way to stay in touch.

COMPOSING MESSAGES

Before getting started you should make sure that you have an accurate list of names, dates and email addresses. Ages are a nice touch if you can get them, but obviously that's not always possible. If you're organised enough to have all this data already entered into Outlook's Contacts database, then all the better, but if not, just write everything down on a piece of paper and make sure that it's handy.

Open up Microsoft Outlook, go to Mail and create a new folder under the Outbox, naming it Birthday Emails. This will be used to organise each of the messages you're about to create and to separate them from regular outgoing mail. New messages need to be dragged into



Choose logical times for your messages and reminders.

Make sure to include only the details you need in any outgoing messages.



SMSpup offers a great free service if you're willing to "earn" your credits...

K!Alert can turn reminder alarms into emails for you...

this folder manually, or otherwise they'll stay in the main Outbox.

Next, create a new blank email message. This may end up sitting dormant for almost a year, so avoid including current details and keep the content simple like a regular ecard would be. ❶ If you prefer to send personal typewritten messages, any format mode will do (Plain, Rich Text, or HTML). If you want to use graphics and multimedia, ensure that the outgoing message format is set to HTML.

For the graphics-challenged, an easy way to find appropriate images is to search online for free stock photo sites. Stock.xchng is a good example of this — and it's the place where we found our sample images. Alternatively, you can use an ecard creator like Apple iCards to build a graphic and just save it to your hard drive. Although the .mac service that includes iCards is subscription-based, iCards itself continues to be available free of charge.

When you're done drafting the email, add an appropriate subject line and fill in the relevant "To" address. Don't press the Send button just yet, though. Instead, click Options... in the message window toolbar. A dialog will appear with various controls on it. At present we're only interested in "Do not deliver before", which is the feature you'll be using to defer delivery of each of the birthday greetings.

For each person on your list, create an email, as described above, and select a delivery date that corresponds to his or her birth date. Choose a time relevant to the individual: when they're most likely to be around to receive it. Remember, this won't seem very authentic if all your messages are sent out at exactly 12am midnight.

❷ Also, if your computer is only active during the week, and the date falls on a weekend, choose the soonest preceding day that makes sense.

Don't forget: Outlook's recurring appointments and reminder functions can be made to trigger an SMS text message.

SETTING REMINDERS

Before getting into the process of setting appointments and reminders for each of the messages just created, leave Outlook and go in search of an Email-to-SMS gateway service. These gateways are special servers that accept incoming emails and pass them on to the mobile telephone network as text messages. Getting an account on such a server means you'll be able to email yourself a message and receive it via SMS.

Which services exist in Australia? SMSpup is recommended for those who don't mind earning credits by viewing promotions and filling out surveys (the service is quite tasteful and is audited for privacy). Otherwise, a paid account can be had cheaply enough with a provider like Fast Connect (ABN holders qualify for a free 20-message trial). Once you have an Email-to-SMS account, you should receive an address like 0418xxxxxx@smspup.com or 0418xxxxxx@fastconnect.net.au, where the username is your own mobile number.

❸ **Note:** Using SMSpup you can collect roughly 5-10 credits a month, which is enough to cover occasional reminders but not much else. To be sure that nobody else can send messages to your phone with the account and waste valuable credits, use the White List feature at the SMSpup web site and place only your own name and address into it.

Pavlov's Emailer: SMSpup's text message credits are "free" in return for viewing targeted advertisements and surveys.

Next, download and install the freeware K!Alert plug-in for Outlook 2003 (Office 97 and XP users are out of luck here). K!Alert is a very

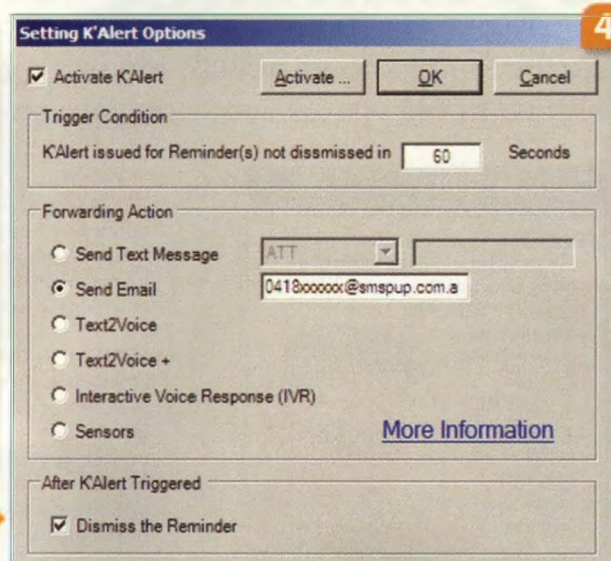
simple gadget that can turn a reminder alarm into an email — if the original alert dialog is not dismissed by hand. ❹ In other words, if an Outlook reminder pops up on your screen and nobody is there at the time to handle it, K!Alert kicks in and sends a version of the reminder to a specified recipient — in this case, your Email-to-SMS account.

Stay alert: K!Alert notices when reminders aren't dismissed, and can forward them on to another location in case you're out.

With K!Alert up and running, go ahead and configure it by clicking the newly added button on Outlook's toolbar and type in your Email-to-SMS address in the field provided. The option you're looking for is "Send Email" (ignore "Send Text Message", it only applies in the USA). Keep in mind that K!Alert's options apply to all reminders, not just the ones you're creating as part of this Workshop.

Note: If you've already migrated to Windows Vista, K!Alert may not work for you. At the time of writing, K!Alert is only available for .NET 1.1, and that version of .NET Framework is not supported by Microsoft beyond Windows XP. However, you can still get the SMS functionality described here by placing your Email-to-SMS address in the Bcc fields of all your outgoing messages. The main downside is that your SMS credits will be used up regardless of whether you're at your desk or not.

To finish off, open the Outlook Calendar and set an annually recurring appointment with a reminder alarm for each of the birthday messages in the Outbox subfolder. Name each of the appointments in such a way that they contain the name, number and age of the person involved (eg. "Jenna, 0418xxxxxx turning 30"). That way, if and when the reminder is diverted to SMS, it will contain all the information you need on the go. **ETC**





Optimising LAMP, part 3

Jarrold Spiga shows how to measure your system performance and get an idea of how many visitors your server can actually handle.

JARROLD SPIGA

Jarrold Spiga is an infrastructure and network engineer who specialises in getting Linux and Windows systems happily coexisting with each other. He currently holds CCNA and numerous MCP certifications and dabbles in web application development in his spare time.



SKILL LEVEL

Intermediate

TIME TO COMPLETE

Two hours

REQUIREMENTS

Apache HTTP web server; PHP

IN THIS SERIES

- Part 1 – December '06
Linux and MySQL
- Part 2 – January '07
Apache and PHP
- Part 3 – February '07
Benchmarking and tuning

The mod_status Apache module can provide instantaneous performance statistics, which can help provide understanding of what's going on.

So, how do you tell whether any of our LAMP optimisations are making any real difference? In order to properly tune a system for maximum performance, you need to record a baseline, make the configuration adjustment and then measure the results.

BEGIN WITH THE BASELINE

Provided that the mod_status Apache server module is active, there is a very quick way to get a snapshot of exactly what Apache is doing on your server. Simply add the following code to your /etc/httpd/conf/httpd.conf file (or alternatively, to a new configuration file /etc/httpd/conf.d):

```
<Location /server-status>
    SetHandler server-status
    Order deny,allow
    Deny from all
    Allow from 192.168.1.1
</Location>
ExtendedStatus On
```

In order to prevent anyone from being able to see these statistics, be sure to edit the IP address listed in the "Allow from" line so that it only

includes the IP addresses of hosts to which you want to provide access.

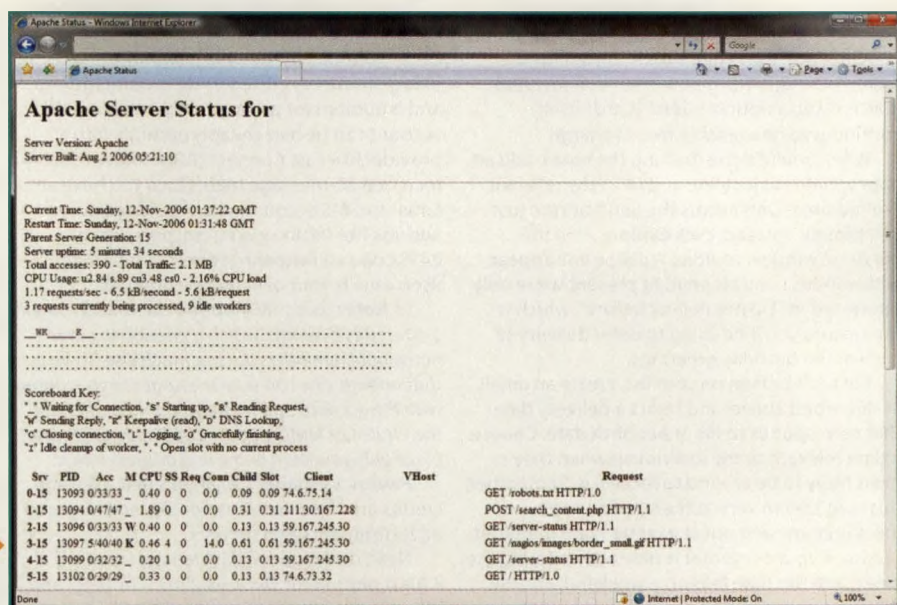
Once you have amended your Apache configuration, reload Apache and navigate to <http://server-name/server-status>, where server-name is the name of your server. A wealth of useful information is presented in the report — especially in relation to the state that every worker thread is in (useful in tuning when and how Apache should create new threads and processes), down to identifying which pages are being loaded from which virtual hosts.

By comparing the output from this status report page before and after any configuration tweaks you make, you can get a better idea of how Apache is actually behaving. When used in conjunction with more customary Linux status tools (top, free, ps etc.), you can generally get a feel whether you're gaining anything in the short term from any tweak you make.

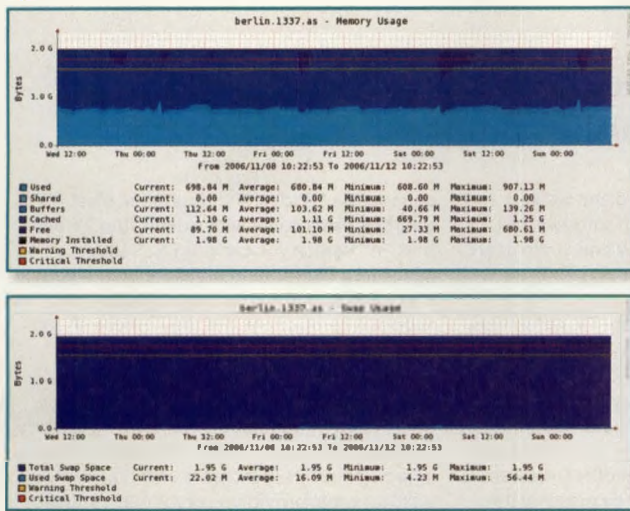
LONG-TERM TREND ANALYSIS

But getting instantaneous snapshots is only half of the story. Many configuration changes are not so subtle and need to be monitored over a period of time. Tools such as RRDTool (the more flexible successor to the famous MRTG) are brilliant for automatically obtaining and plotting various statistics over long periods of time.

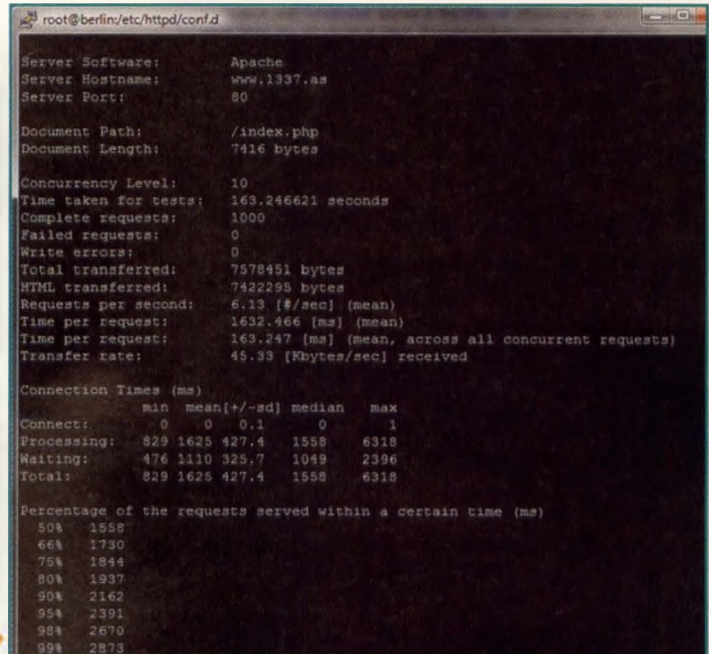
RRDTool is a series of applications that have two main purposes. The first gathers data and



RRDTool Memory/Swap usage: RRDTool can be used to provide longer-term performance trend analysis.



The Apache Benchmark tool can be used to simulate higher traffic loads to ensure you're prepared for any influx of visitors.



stores it in a round-robin database (hence the RRD portion of the name), and the second queries the databases and generates graphs based on the data.

While the details on how to configure and use RRDTool are themselves worthy of discussion, there just isn't adequate space here to present it all. However, there are very good tutorials posted at <http://oss.oetiker.ch/rrdtool/tut/index.en.html>. As an alternative, you could try using Cacti — a popular web-based front end for RRDTool.

When set up and left to run, you can trend just about anything. Above is a sample of a couple of graphs that I have personally created from scratch (a fairly simple PHP script parses the output from the "free" command in order to supply RRDTool with the relevant data). Savvy script writers will undoubtedly even be able to chart the Apache server status shown previously.

APACHE BENCHMARKING

Seeing how your web server is currently (and has been) running is really only half of the story. No matter how much statistical analysis that you do, you will never be able to predict how your server will behave come the day that you show up on the front pages of Slashdot or Digg.

Fear not though, because most Apache installations include the "ab" (Apache Bench) synthetic benchmarking tool. This command line utility allows you to perform rudimentary stress testing on your server. But before going into too much more detail, the following points about ab should be noted:

- ab cannot replicate real web site traffic, instead repeatedly requesting for the same resource over and over again. Most visitors to your site will not be doing this.



YOU'LL NEVER PREDICT HOW YOUR SERVER WILL REALLY DO TILL YOU'RE ON THE FRONT PAGES OF SLASHDOT OR DIGG

- ab only loads the URL that you requested. Any other content referred to by the pages (including images and video) is not loaded by the tool. Again, this is not the behaviour that most of the real visitors to your web site will exhibit.
- If ab is run from the same system that you are stress testing, keep in mind that ab processes will also consume memory and CPU resources. For more accurate testing, ab should be executed from a different Linux system to where you're serving pages from (if you have access to them, you could also try running ab from multiple hosts simultaneously).
- Any server side caching that is used (for instance, if you use a squid proxy on your server) could skew your results.
- You will probably not get exactly the same result every time that you run ab — all sorts of factors will affect the performance results that you get, including how busy your server is at the time the test is run, and the hardware in both the server and client.

All that aside, ab is extremely useful for finding out how responsive your server is under a variety of different loads. If you utilise PHP scripts, it can also be invaluable to optimise the code that you develop for efficiency.

To run a fairly simple stress test, simply run:

```
ab -n 1000 -c 10 http://server-name/index.html
```

When executed, this will attempt to request the URL specified at the end on the command 1,000 times (the n argument), using 10 concurrent processes (the c argument). By default, ab will exhibit typical HTTP behaviour and not utilise keep-alives (ie. each request for a page is treated as a separate request and a new socket between server and client is initiated for each iteration). Adding the -k switch will override this default.

Depending on the values that you use for the two arguments, the tool can take anywhere from a few seconds to hours to complete. The example shown above provides a good demonstration, but will not simulate the heaviest of loads. As such, feel free to adjust the numbers you put in to the script to simulate various types of loads.

Naturally, you would also want to be careful running such tests on a production server — running an overly aggressive benchmark will most likely affect the response times of people who are legitimately trying to view your site. Likewise, you shouldn't use this tool against sites that are not yours, as doing so could be construed as a denial of service attack.

When you consider that a 0.1 second response time is frequently considered to be desirable, a one second response is acceptable and a 10 second response time is unacceptable, the results of this benchmarking should give you an idea as to how many visitors your server can really handle. **ETC**



Connecting up

Stephen Withers completes APC Workshop's media PC project, connecting all the pieces together and examining the finished product.

STEPHEN WITHERS

Stephen Withers has been writing for APC since its second issue. With a professional background in operations research and IT, he switched to full-time writing and editing in 1990. As much as he enjoys cutting code, he now has insufficient time for anything more complex than scripting. Stephen has been networking computers since the time when an Ethernet card cost more than a PC.



SKILL LEVEL

- Intermediate

TIME TO COMPLETE

- Varies

REQUIREMENTS

- Various home entertainment equipment as listed in article.

IN THIS SERIES

- **Part 1 – December '06**
Assembling the hardware
- **Part 2 – January '07**
Installing the software
- **Part 3 – February '07**
Connecting to home entertainment equipment

Our media PC is assembled and we've installed the appropriate software, but how do we connect it to our TV and audio gear?

DIRECT TO TV

Running the audio signal to your TV, rather than through a stereo, might result in lesser sound quality, but it has one big advantage. That is, when you pick a video source, you're also selecting the corresponding audio connection. So, by plugging the PC into one input and (say) your pay TV set-top box into another, you can choose between them simply by pressing the source button on the TV's remote control.

There are numerous ways to connect your PC to your television — some better than others. If you are lucky, you may have a DVI input on your television, in which case connection is as simple as plugging in a monitor. Similarly, connecting a HDMI video card to a HDMI enabled TV is a simple case of plug and play.

Connecting the PC and TV via DVI is very simple: just run an appropriate-length DVI cable between them. A 1.5m cable costs around \$30, so there's no real problem if the equipment is close together. If you're using a permanently mounted projector, for example, the cable run may be more than the generally recommended 5m maximum, in which case you might need a DVI repeater or extender. Some manufacturers do offer cables longer than 5m but, given their cost, we'd be inclined to ask for a money-back guarantee of suitability.

For the audio signals, you'll likely need a 3.5mm stereo plug to dual-male RCA cable. The 3.5mm plug goes into the green Line Out socket on the back of the PC, and the RCA connectors go into the TV. If you are lucky you'll have a S/PDIF connector on your TV or stereo, which is the preferable option.

While those using projectors and some televisions will be able to connect via DVI, HDMI or D-sub, the majority of people will need to

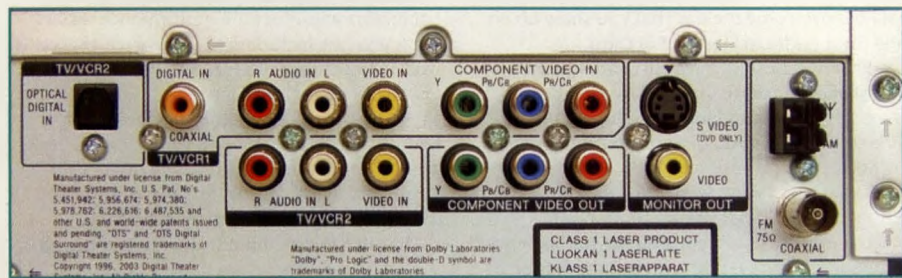
connect via S-Video or Component. Most graphics cards come with a dedicated TV-out port, into which you can plug an S-Video adaptor or Component breakout box — you may need to make sure your model of video card supports component, but they'll more often than not do S-Video.

Component video — with three sets of signals carrying luminance and chrominance information — is a good alternative if your video card and TV support it. The Palit 7300GT Sonic video card we used includes an octopus-style adaptor cable providing component, S-Video and composite outputs, as there isn't room on the bracket for all these sockets.

S-Video is preferable to composite if you only have a standard-definition television, as the brightness and colour signals are kept separate, giving better quality. You're unlikely to see anything other than an RCA connector on composite video, while S-Video uses a four-pin mini-DIN connector.

Finding the best settings for the video card to work optimally can be challenging, even though the Nvidia software includes a wizard to help with the task. After extensive trial and error, we settled on 720p, although those using S-Video or composite will end up using 800 x 600 or lower resolution. To adjust the setting, right-click on the desktop and select Properties, then click the GeForce 7300 GT tab (this will vary according to the card installed). Click on Device Settings, choose a setting from the Select TV format sub-menu and then click Apply. If the setting doesn't work with your screen, wait 15 seconds and Windows will revert to the previous setting. If you like what you see, accept the change.

Our test TV had a single logical input covering both the composite and S-Video connectors, with a pair of RCA sockets for the audio. The composite input is the one you'd typically use to connect a VCR, DVD player or set-top box to the TV.



This Sony home theatre unit has two spare inputs for video sources, but only one takes component video.

The audio driver software automatically detects connections to the audio outputs — here, the left and right speakers are highlighted.



The red DVI connector is clearly visible here, along with the 3.5mm sockets for decoded surround sound.

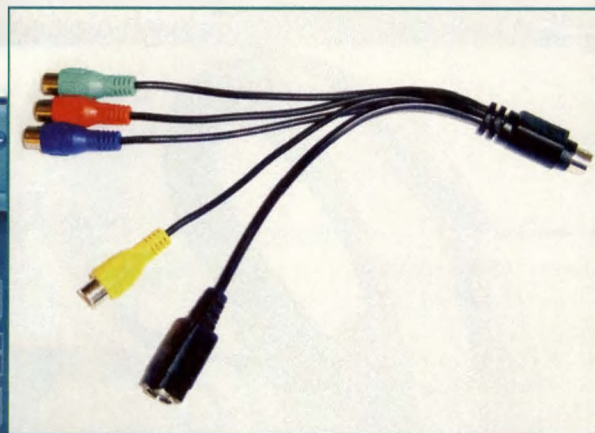
If you are using composite or S-Video, set the video card for PAL output or you'll get a monochrome image. Our Palit card was supposedly set via a jumper, but the jumper position on the PCB was not populated on our sample. Some TVs may handle an NTSC signal automatically, or can be set for that standard.

PC-TO-STEREO AMPLIFIER

Connecting the two-channel output from the PC to an amplifier or other audio system is as simple as connecting it to the TV: just run a cable from the PC to a spare input on the amp. You'll most likely need a 3.5mm stereo jack plug to dual-male RCA cable.

One hassle with running audio through a separate piece of hardware is that you'll need to separately select the audio and video sources. If the TV has an audio output, you can run that to the amp instead and get the benefit of audio switching alongside the video source selection. You can also get a third party AV switch to send video to the TV and audio to the stereo.

For best quality, connect the PC's digital audio output to the receiver's digital input with an optical or coaxial cable. If either device lacks a digital interface, fall back to using the PC's 5.1 or 7.1 decoder, and run analogue cables instead. Typically, you'll use three (four for 7.1) cables each with a 3.5mm stereo jack plug at one end and a pair of RCA plugs at the other. Unless you can find a cable that carries all these signals, a cable tidy or at least some cable ties is a good idea to avoid ending up with a rat's nest.



This cable plugs into the round socket at the top of the video card and breaks out (from top) the component, composite and S-Video signals.



THERE ARE NUMEROUS WAYS TO CONNECT YOUR PC TO YOUR TELEVISION — SOME BETTER THAN OTHERS

Our Sony FXG9K home theatre unit accepts optical or coax digital audio, or stereo analogue audio (and supports component video in and out).

If you're taking the analogue route, some AC'97 and all Intel HD audio-compliant hardware will have the ability to detect connections being made to the audio outputs and pop up a window advising which pair of speakers (eg. left and right front, or centre and subwoofer) it thinks has been plugged in. Even if your system lacks this convenience, you should have few problems as long as you work methodically.

WRAPPING IT UP

If we built our media PC again, we would do some things differently. Firstly, we'd avoid making any compromises (for the sake of having a multi-purpose unit). This would make it easier to reduce noise levels through the use of passive cooling for the CPU and graphics adaptor. We'd also seek out a quieter disk drive and DVD burner.

Secondly, there's the form factor. The Thermaltake Mozart looks great and has several useful features, but in retrospect a slimline home theatre PC case would be a better fit with the surroundings. If you want to go smaller, we still think it's hard to go past a Mac mini plus USB tuners — especially now that all configurations are based on the Core 2 Duo.

Finally, even though integrated graphics aren't much chop for games, they can be perfectly adequate for an entertainment system if done right. One major issue with integrated graphics is that the signal is often "dirtied" by interference from other motherboard components. If the right physical video interface (eg. HDMI) is present, this further reduces the complexity and noise levels. We would also go for a motherboard with digital audio output.

And so, that completes this series! We'd like to thank all the companies that supplied our components and made this possible. **BTB**



ape downtime

HIGH-PERFORMANCE PLAYTIME

GEAR

BOOKS

GAMES

CHIP CHAT



Voyager 510-USB Bluetooth Headset System

This VoIP headset is flippin' sweet and sort of reminds us of that guy that helps Lando Calrissian in Cloud City. It's possible Lando or Darth Vader didn't know back in the '80s that the VoIP revolution was ahead of us, so you get the added bonus of being on the cutting edge. Did Darth actually use a mobile or phone? If so, he may have appreciated the ability to roam 10 metres from his workspace using the supplied USB Bluetooth adapter, or the one-touch switching between calls from his mobile phone and office phone.

The IT Crowd

Definitely one for fans of geek humour (including jokes involving screen savers). If you're into British comedy like *Black Books* or *Father Ted*, you may well warm to the geek-like charms of techies Roy, Moss and Jen. Will geeks inherit the Earth, or are they destined to live out their lives in dinghy, basement-like offices like this, googling for witty comeback lines and kitten photos? Our favourite though is still *The Office's* helpdesk guy, for his discussions on Bruce "Way of the Dragon" Lee and tales of his weekend stunt work on the track.

NU Dolphin Swimmer MP3 Player 1GB

Whoever you are, NU designers, we salute your design skills. Case in point: attaching MP3 players to your swimming goggles. People said it couldn't be done, but the NU design team proved us all wrong with their "100% waterproof" MP3 players (up to 2GB). "Doesn't the water get in?", I hear you ask. Not when the headphones screw in. Don't the earphones fall out? Not when there's a silicon earplug to keep them in your ear. Won't it look stupid though? Again no, it's rather stylish. Actually, this could be quite handy if you swim laps.

JBL Spot and Spyro

Do you remember the rectangular speakers attached to 17in CRT monitors? Did you think, "I'm on the cutting edge of multimedia"? They were crap compared to these. The two different speaker sets here look vaguely like they could have come from *The Matrix* or *2001*. Named "Spot" (pictured) and "Spyro", these speakers work with MP3 players, portable DVD players, PCs, notebooks and anything with a "mini stereo jack". To change the colour and look to suit your décor, you can get a hold of "JBL Wrappers" in different designs.

CONTACT Plantronics
ONLINE www.plantronics.com.au
PRICE US\$199
VERDICT ★★★★★

CONTACT Hopscotch Entertainment
ONLINE www.hopscotchfilms.com.au
PRICE \$30.90
VERDICT ★★★★★

CONTACT Anyware
ONLINE www.anyware.com.au
PRICE \$189
VERDICT ★★★★★

CONTACT Apple
ONLINE www.apple.com.au
PRICE \$229.95 (each)
VERDICT ★★★★★

APC
UBER

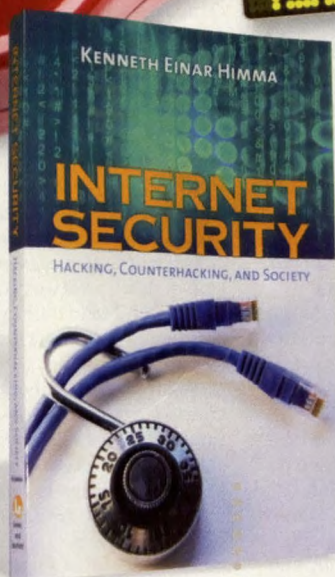
Super cool

APC
1337

Very cool

APC
n00b

Uncool



Line 6 PODxt

This gizmo is great for anyone with an electric guitar who loves jamming around in their lounge room and maybe even recording to their computer. The PODxt is a small plastic device that gives you stacks of effects, distortion types, echo and classic amp sounds. You know all those effects boxes you see guitarists using on stage? This thing tries to emulate those, so you don't have to fork out for loads of gear. There's an inbuilt tuner, USB so you can plug in to a PC easily, and headphone jack so you can play without annoying the neighbours.

CONTACT Musiclink
ONLINE www.musiclink.com.au
PRICE \$799
VERDICT ★★★★★

Internet Security: Hacking, Counterhacking, and Society

A philosophy teacher writing about World of Warcraft security attacks and phone phreaking? If you're after a more cerebral take on net crime, this collection of essays tackles the subject from the angle of ethics — whether the law and software developers are taking the right approach to protecting our PCs from hackers. There's no single conclusion, but the general angle is that technical blocks and legal threats aren't the answer. Great! Looks like more patches, fixes and update installs then, until someone develops the uncrackable OS.

CONTACT Elsevier Australia
ISBN 9780763735364
PRICE \$89.50
VERDICT ★★★★★



Sony Ericsson W950i

This Sony Ericsson W950i phone is seriously expensive — and seriously flashy, as well. The killer is the storage capacity — a ludicrous 4GB, which amounts to up to 4,000 songs (according to Sony Ericsson). There's also a 240 x 320 pixel screen, web browser, USB, email and FM radio. But why stop there? With the W950i, there's also handwriting recognition, RSS feeds, email, video streaming... and some other stuff you may or may not get to before the battery gives up the ghost. *Plus:* you can also make phone calls.

CONTACT Sony Ericsson
ONLINE www.sonyericsson.com
PRICE \$1,099
VERDICT ★★★★★



Cyber Snipa Dog Tags USB Flash 1GB with ToolKit

Just because you work in IT doesn't mean you can't look like you've stepped off the set of *Rambo*. These look like ordinary dog tags but hold some potentially handy items. Inside one is a USB key (512MB to 4GB), for those important software drivers and Word docs. In the other is a set of tools, including a pair of scissors, a light, and ahh... some nail files (just tell people they're for filling down screw heads). At least they're around your neck — here at APC, we're forever forgetting where we've left our USB keys.

CONTACT Anyware
ONLINE www.anyware.com.au
PRICE \$101 (1GB)
VERDICT ★★★★★



Gears of War

Dan Chiappini kills some bugs and does some backyard blitzing.

Gears of War is the title the Xbox 360 should have launched with: the title that finally shows off what next-generation gaming should look and feel like.

The storyline is a bit thin and leaves the game to rely heavily on letting the action speak for itself — and it's a deadset screamer from start to finish.

Probably the best way to describe it is a game of military hide-and-seek: you'll spend the game hopping from cover to cover, using everything from walls, pillars and burnt-out car corpses to keep enemy fire out of your face. Think Resident Evil meets Brute Force with a dash of Ghost Recon and the Choose Your Own Adventure books. The control system is intuitive and easy to manoeuvre and, once safely behind something, you're able to use suppression fire to cover your team mates (without exposing yourself) as they flank or snipe. If the action gets a bit too hot, you can always roll to a safer spot or jump the barrier to come out guns blazing. The latter isn't always your best option, and

GoW isn't your traditional run-and-gun-type



shooter, as in most cases it's a better idea to hope you're carrying a decent-ranged weapon and pick off enemies from a distance.

Rifles, grenades, bows and machine guns make up your arsenal, with a couple of nifty features thrown in to make them more useful. Pressing the left-controller trigger with a grenade equipped shows you its planned trajectory, including throwing distance and any deviation from rebounds. This is particularly useful for trick shots off walls into areas too heavily guarded to run in firing. Each weapon has a segmented scroll bar underneath it, indicating reload time. Pressing your reload button and stopping it in a certain

zone gives you a quick reload; hitting the right spot provides a temporary damage buff and ups your power. There are penalties for stopping outside the speed and bonus zones — a mis-reload sees your gun jam and you'll be forced to wait the entire reload time.

For all-out carnage, the Hammer of Dawn is the ultimate in outdoor renovations. Point, lock and explode with an energy blast from an overhead satellite.

There are no health packs in GoW, but the brightness of the glowing red cog in the middle of your HUD tells you when it's time to get out of the line of fire. Hit bright and you're pushing up daisies.

GoW supports single-player,

.. CONTACT Microsoft

.. ONLINE www.gearsowar.com

.. PRICE \$99.95

.. PLATFORM XBOX 360

✓ Single-player co-op; looks gorgeous; great fun.

✗ Short single-player campaign.

.. VERDICT ★★★★★

split-screen co-op on the same TV, system link, or the single-player campaign via Xbox Live (which is a real treat for you and a buddy to battle through online — game difficulty ramps quickly and you'll need the help).

The game's audio and visuals are superb and undoubtedly the best demonstration yet of the level of realism people have been expecting from next-generation consoles. If GoW represents the kind of detail level we can expect from second- and third-generation 360 games, the Xbox's future is looking spectacular.

At around eight hours, our only criticism is the shortness of the single-player campaign but, even still, there's plenty of replayability and online support to make up for it. It's still the best game we've played this year and well worth picking up. Best of all, Marcus Fenix, the lead role, is voiced by John Di Maggio, voice of Bender from Futurama.

"Hey, Marcus! When can we go bend some enemies?"

Guitar Hero II

John Gillooly finds a legitimate reason to game in leather pants.

Sick of karaoke? Think dancing games are the epitome of silliness? Is your inner rock god feeling neglected? Then Guitar Hero 2 is here to save you. The sequel to the cult hit from early 2006, this PS2 game involves using a guitar-shaped controller to play along with iconic rock songs.

At heart it's a simple hand-eye coordination affair. Hold down the correct button on the fret and tap the strum bar on the controller in time with the onscreen display. What makes it a sublime experience is how well this gameplay syncs with the music being played. Miss a note and you'll hear it; get it right and you really feel like you are pumping out some classic riffs.

While the music leans heavily towards fast rock and heavy metal, there's actually quite a range of famous songs to get to grips with. From "Message In A Bottle" by the Police to "Institutionalised" by Suicidal Tendencies, there are numerous finger-destroying riffs available, and the game ranks in

complexity as you progress through the various "sets" that make up the bulk of the game.

Also included is an in-depth practice mode, which lets you master some of the trickier sections of songs, and a cooperative-play mode where one person plays lead guitar and one bass or rhythm guitar. What really helps is that in co-op play, the difficulty settings are independent to each other, which means a beginner can quite happily play alongside a seasoned pro without feeling overwhelmed (just out-rocked).

It's hard to describe just how much fun this game is. Standing in front of the screen, clutching the guitar controller and madly trying to keep the fingers moving in time makes you tap into your rock god within. It's like air guitar without the need to close your eyes and imagine the cheering crowds.



:: CONTACT Activision
 :: ONLINE www.guitarherogame.com
 :: PRICE \$79.95 (software only)
 :: PLATFORM PS2
 ✓ Live out all your air guitar fantasies.
 ✗ Controller takes some getting used to.
 :: VERDICT ★★★★★

Football Manager 2007

Daniel Withers takes his team to the top of the league.

If you're still bitter about Fabio Grosso's dive that knocked Australia out of the World Cup, the 2007 release of Sports Interactive's Football Manager gives you the chance to pick up where Guus Hiddink left off.

With over 100 new features, Football Manager 2007 is one of the few sports games that delivers significant improvements (rather than just a fresh cover each year). Sports Interactive is constantly improving a title that is already head and shoulders above the rest.

The most notable change in this season's additions are affiliate clubs, where you can develop relationships with other teams to enhance your playing squad or give your reserves some first-team experience.

Scouting has improved, as the scouts' knowledge increases with experience, and their report cards give you quick and detailed information. Football Manager also includes a visually appealing new skin and hints and tips throughout the game — a good way for new players to learn the ins and outs of this relatively complex game.

The managerial experience is much more hands on. FM2007 takes the virtual world to a new level, really giving the impression that you are managing a team of individuals, rather than just a group of names on the screen. You can talk to any player in the game about their performance or potential signings (and even their role in the sport following their retirement).

Before your team takes the field, you are posed questions by

the media and get the chance to give your side a pre-match team talk, hopefully motivating them for the game ahead.

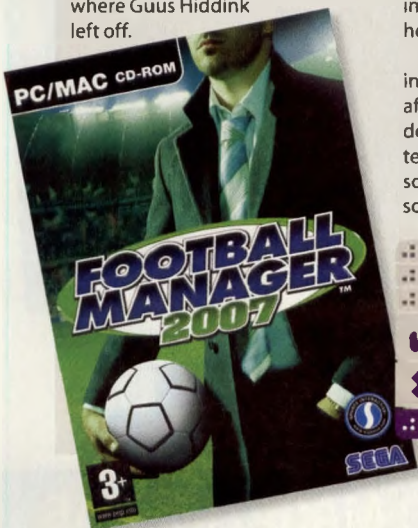
The depth of FM2007 is simply astounding. It contains a database of over 300,000 players and staff from hundreds of clubs in 50 countries. The extensive nature of the game means that there are endless challenges. You can attempt to emulate an Alex Ferguson-esque dynasty with one of Europe's powerhouse clubs, or you can build a small club up from the basement. And for those caught up in Australia's football revolution, the A-League is now fully licensed and all eight teams are manageable.

Sports Interactive's latest release is so realistic, you'll become utterly immersed in the world of football management.

:: CONTACT THQ
 :: ONLINE www.footballmanager.net
 :: PRICE \$89.95

✓ Engrossing; focuses on strategy rather than reactions.
 ✗ Database editing far more restricted than in FM2006.

:: VERDICT ★★★★★



Psssst... ...wanna buy a notebook?

IT'S THE FASTEST WAY TO FIND THE BEST PC GEAR IN AUSTRALIA!

APC's Best Tech list is now online at www.apcmag.com/BestTech. Get all our inside tips on the best notebooks, LCD TVs, modems, printers and more.

We got sick of our neighbours/brothers/cousins bugging us for info about the best gear to buy, so now we're posting it all online: our favourite killer products across 50 categories.

About to buy a family PC?

We've got the essential picks, including the best all-round systems on the market today (and decent cheapies that won't run like a dog).

Want an iPod alternative?

We're always on the lookout for the next iPod killer. (Coincidentally, we also have hate mail from Apple fans.)

We just list the best stuff, so you don't spend ages trawling through millions of web reviews.

Oh, and did we mention you can post your own comments and read what other people are saying? So — get online and get involved!

50 CATEGORIES
OF THE BEST
TECH GEAR



FROM AUSTRALIA'S LONGEST-RUNNING PC MAGAZINE LAB

24hr wireless connection

Christ

"Draw near to God, and he will draw near to you." James 4:8

24hr wireless connection

Christ

"Draw near to God, and he will draw near to you." James 4:8

Let's get it on

The ZVOX (pronounced "zee-vox") Ingenious Audio range press release isn't backwards in coming forwards: "Are you a lover or a mere listener?" it boldly asks. The difference, apparently, is that listeners only "hear", while lovers *experience* sound "as a sensual journey". The ZVOX claims to revolutionise home theatre, wrapping "sound around you like the arms of an Italian lover." Indeed, the one-piece speaker box is said to "seduce" all who hear it and to send the (aforementioned) lovers of sound "weak at the knees", putting a whole new spin on the category — which it won in 2006 — of "Convergence Product of the Year" (*US Home Theater* magazine). Woah. Maybe it's time to invite that special someone round, dim the lights and break out that *Barry White Live* DVD. . .

DELIVER US FROM DIALUP

It can be confusing these days, what, with all the differing varieties of wireless technology on offer. . . sometimes it can be hard to tell your 3G from your 802.11a/b/g. In such disconnected times, it's reassuring to be reminded, billboard-style, about the one, *original* all-embracing Wi-Fi in the sky. At least, such must have been the reasoning at work in downtown Sydney's Central Baptist Church on George St, which recently displayed this rather unique adaptation of the Telstra logo (above). Of course, as blogger Alan Baxter put it on www.alanbaxter.info, "the church comparing itself to Telstra is like a nanny using [Joseph] Goebbels as a referee in a job interview." Ouch. I wonder what they'll make of Next G? **ETC**

Infinion Security Platform Taskbar Notification Icon

Catastrophic failure

OK

Women and children first!

Error messages (aka. "user's bane"). They tell you why what you want to happen ain't happenin' — and often in some strange tongue or dialect that only a well-educated chipset could hope to decipher. But sometimes, just for a change, these little pests get straight to the point (and don't pull any punches, either), as former APC Editor David Flynn discovered recently: "This was taken from an ASUS notebook I was using last week. It's nice to see an error message that doesn't beat around the bush with some namby-pamby warning — but comes straight out and tells it like it really is!" And then some. After all, what part of "Catastrophic" don't you understand?



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Take No Prisoners



Antec Nine Hundred

The most killer gaming case in any world is now yours to equip—the Antec Nine Hundred advanced gaming case. Top mounted 200mm mega fan and dual front-mounted 120mm fans mean your weapon will never shut down due to overheating. A full complement of nine modular front bays supports almost any combination of optical and hard drive devices you want to carry into battle. And the windowed side panel lets the shock and awe begin at the mere sight of your system. Antec Nine Hundred—the case for fearsome gaming systems.

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	Game Dude Pty Ltd Online	07 3387 1500	www.gamedude.com.au			
VIC	CentreCom		www.centrecom.com.au	Scorpion Technology	1300 726 770	www.scorptec.com.au
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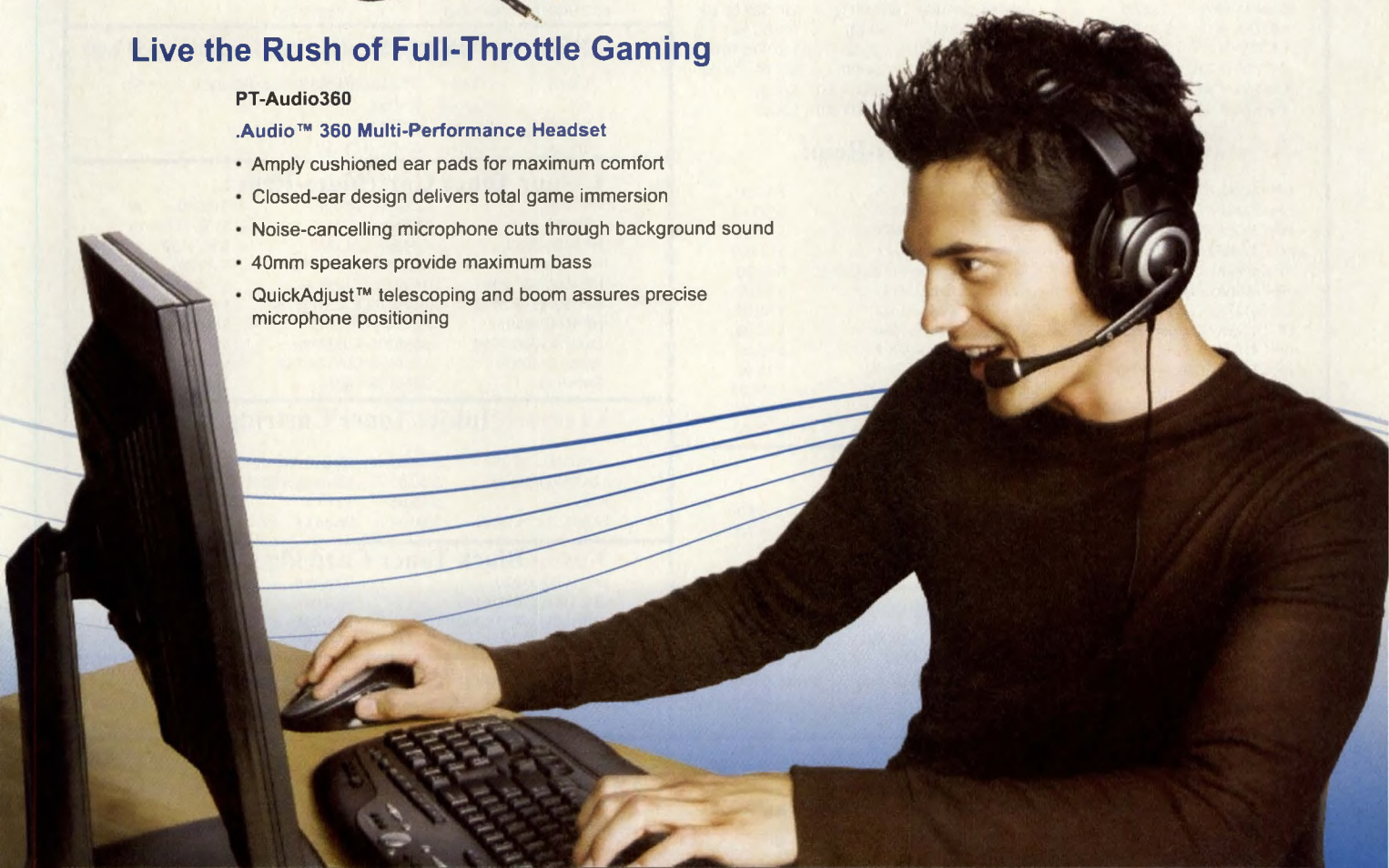
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Epson C900/C1900	(S050100/97/98/99))	\$ 95/\$115 ea
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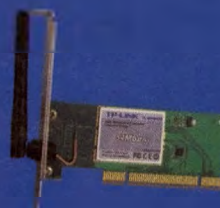
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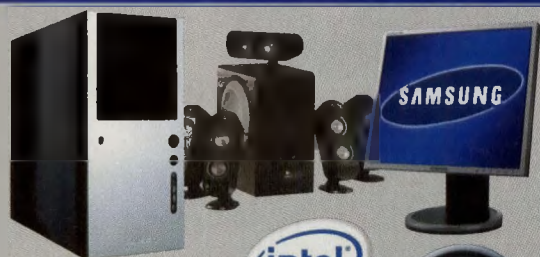
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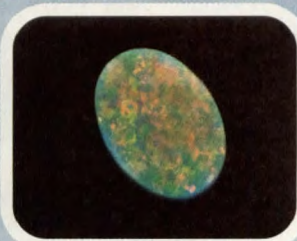
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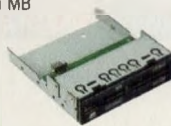
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BCI-24C	\$33.00	\$7.20

Model	Genuine	TONNY
BX-3	\$49.00	\$28.00
BC-02	\$39.00	\$28.00
BC-03	\$38.00	\$28.00
BC-05	\$50.00	\$30.00
BC-20	\$49.00	\$28.00
BCI-36BK	\$25.00	\$ 8.80

Model	Genuine	TONNY
BCI-36C/M/Y	\$19.00	\$6.40
BCI-6BK	\$24.00	\$6.40
BCI-6C/M/Y	\$24.00	\$6.40
BCI-6G	\$24.00	\$6.40
BCI-6R	\$24.00	\$6.40
BCI-6PC/PM	\$24.00	\$6.40

Model	Genuine	TONNY
BCI-15BK	\$24.00	\$6.40
BCI-15C	\$44.00	\$7.20
BCI-16C	\$44.00	\$7.20
BCI-21BK	\$13.00	\$4.90
BCI-21C	\$28.00	\$6.40

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Model	Genuine	TONNY
PGI-5BK	\$22.50	\$8.50
CLI-8BK	\$22.50	\$8.50
CLI-8C/M/Y	\$22.50	\$8.50
CLI-8PC	\$22.50	\$8.50
CLI-8PM	\$22.50	\$8.50

Epson Ink Cartridges

Model	TONNY
T001	\$18.90
T003	\$ 9.90
T005	\$18.00
T007	\$ 9.30
T008	\$13.00
T009	\$15.00
T013	\$ 4.50
T014	\$ 7.90
T017	\$ 9.70
T018	\$10.60
T026	\$ 9.70
T027	\$12.40
T028	\$ 9.70
T029	\$10.60

Model	TONNY
T038	\$ 9.60
T039	\$10.60
T0321	\$10.80
T0322	\$ 7.50
T0323	\$ 7.50
T0324	\$ 7.50
T0422C/M/Y	\$ 9.50
T0461	\$ 8.90
T0472/3/4	\$ 8.90
T0491/2/3	\$ 8.90
T0494/5/6	\$ 8.90
T0540/1/2	\$ 8.90
T0541/2/3/4	\$ 8.90
T0547/8/9	\$ 8.90

HP Ink Cartridges

Model	Genuine	TONNY
51625A (#25)	\$46.00	\$28.00
51626A (#26)	\$46.00	\$28.00
51629A (#29)	\$46.00	\$28.00
51633MA (#33)	\$41.00	\$32.00
51645A (#45)	\$46.00	\$24.00
51649A (#49)	\$48.00	\$28.00
C1823D (#23)	\$51.00	\$30.00
C4841/2/3/4AA (#10)	\$46.00	\$28.00
C4836/7/8A (#11)	\$48.00	\$18.00
C5010DA (#14)	\$47.00	\$26.00
C5011DA (#14)	\$35.00	\$24.00
C6578D (#78)	\$51.00	\$30.00
C6614A (#20)	\$44.00	\$24.00
C6615DA (#15)	\$44.00	\$24.00

Model	Genuine	TONNY
C6625A (#17)	\$48.00	\$30.00
C6656AA (#56)	\$32.00	\$24.00
C6657AA (#57)	\$51.00	\$32.00
C6658AA (#58)	\$37.00	\$26.00
C8727A (#27)	\$31.00	\$24.00
C8728AA (#28)	\$35.00	\$26.00
C8765WA (#94)	\$31.00	\$27.00
C8767WA (#96)	\$42.00	\$33.00
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C8774/5WA (#02)	\$16.00	\$11.00
C9351AA (#21)	\$24.00	\$21.00
C9352AA (#22)	\$27.00	\$23.00

Brother Ink Cartridges

Model	Genuine	TONNY
LC-21BK	\$30.00	\$7.90
LC-21C/M/Y	\$17.00	\$7.50
LC-02BK	\$21.00	\$7.90
LC-02C/M/Y	\$11.00	\$7.50
LC-04BK	\$28.00	\$7.90
LC-04C/M/Y	\$16.00	\$7.50
LC-47BK	\$32.00	\$7.90
LC-47C/M/Y	\$18.50	\$7.50

Model	Genuine	TONNY
LC-800BK	\$32.00	\$7.90
LC-800C/M/Y	\$18.50	\$7.50

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Lexmark Ink Cartridges

Model	Genuine	TONNY
12A1970	\$48.00	\$32.00
12A1980	\$56.00	\$35.00
17G0050	\$46.00	\$32.00
17G0060	\$53.00	\$35.00
13400HC	\$53.00	\$36.00
13619HC	\$52.00	\$38.00
10N0217	\$33.00	--
10N0227	\$35.00	--

Model	Genuine	TONNY
10N0016 (#16)	\$46.00	\$36.00
10N0026 (#26)	\$49.00	\$39.00
15M0120 (#20)	\$53.00	\$41.00
18C0031 (#31)	\$43.00	\$35.00
18C0034 (#34)	\$43.00	\$35.00
18C0035 (#35)	\$45.00	\$37.00
18L0032 (#82)	\$47.00	\$39.00
18L0042 (#83)	\$53.00	\$41.00

HP Black Toner Cartridges

Model	Genuine	TONNY
92298A	\$139.00	\$ 65.00
C3906A/F	\$ 95.00	\$ 49.00
C3903A	\$120.00	\$ 59.00
C3909A	\$220.00	\$ 95.00
C4092A	\$ 87.00	\$ 49.00
C4096A	\$135.00	\$ 65.00
C4127A	\$145.00	\$ 65.00
C4127X	\$169.00	\$ 80.00
C4129X	\$210.00	\$ 95.00
C4182X	\$239.00	\$135.00
C7115A	\$ 89.00	\$ 49.00
C7115X	\$115.00	\$ 65.00

Model	Genuine	TONNY
C8061X	\$165.00	\$ 85.00
Q1338A	\$189.00	\$ 95.00
Q2612A	\$ 95.00	\$ 59.00
Q2613A	\$ 95.00	\$ 59.00
Q2613X	\$125.00	\$ 69.00
Q2610A	\$155.00	\$ 75.00
Q2624A	\$ 96.00	\$ 59.00
Q5942A	\$190.00	\$ 95.00
Q5942X	\$279.00	\$125.00
Q5949A	\$ 99.00	\$ 59.00
Q5949X	\$169.00	\$ 75.00
Q6511A	\$169.00	\$105.00

TONNY Colour Toner Cartridges

Printer Model	Model	Genuine	TONNY
HP LJ1500/2500, Canon LBP2410	C9700A (BK)	\$115.00	\$ 65.00
	C9701/2/3A (CYM)	\$135.00	\$ 79.00
HP LJ4600	C9720A (BK)	\$199.00	\$155.00
	C9721/2/3A (CYM)	\$262.00	\$185.00
HP LJ4500, Canon LBP2460/2040	C4191A (BK)	\$119.00	\$ 59.00
	C4192/3/4A (CMY)	\$165.00	\$ 69.00
HP LJ8000	C4149A (BK)	\$150.00	\$ 89.00
	C4150/1/2A (CMY)	\$225.00	\$155.00
Epson C900/1900	S050100 (BK)	\$ 99.00	\$ 79.00
	S050097/98/99 (CMY)	\$210.00	\$119.00
Epson C1000/C2000	S050033 (BK)	\$119.00	\$ 90.00
	S050034/5/6(CMY)	\$249.00	\$119.00

Samsung Toner

Model	Genuine	TONNY
ML-1210D3	\$ 94.00	\$ 59.00
ML-1650D8	\$185.00	\$105.00
ML-1710D3	\$ 98.00	\$ 59.00
ML-2010	\$103.00	\$ 59.00
ML-2150D8	\$185.00	\$140.00
ML-4100D3	\$ 99.00	\$ 83.00
ML-4500D3	\$119.00	\$ 73.00
ML-6060D6	\$155.00	\$ 93.00
SCX-4216D3	\$ 99.00	\$ 69.00
SCX-5312D6	\$ 95.00	\$ 79.00
SF-5100D3	\$ 89.00	\$ 59.00

Brother Toner Cartridges

Model	Genuine	TONNY
TN-100	\$ 29.00	\$23.00
TN-200	\$ 42.00	\$23.00
TN-2025	\$ 74.00	\$59.00
TN-300	\$ 42.00	\$23.00
TN-3060	\$125.00	\$65.00
TN-8000	\$ 43.00	\$23.00
TN-6600	\$ 99.00	\$65.00
TN-7600	\$125.00	\$65.00

Canon Toner Cartridges

Model	Genuine	TONNY
EP-22	\$ 99.00	\$49.00
EP-25	\$ 99.00	\$49.00
EP-26	\$109.00	\$69.00
EP-32	\$145.00	\$65.00
EP-52	\$185.00	\$80.00
E-31	\$189.00	\$85.00
FX-3	\$132.00	\$59.00
CART-303	\$ 83.00	\$59.00
CART-U	\$ 99.00	\$69.00

Epson Toner Cartridges

Model	Genuine	TONNY
EPL-5700	\$190.00	\$49.00
EPL-5900	\$205.00	\$49.00
EPL-6200	\$215.00	\$49.00

Lexmark Toner Cartridges

Model	Genuine	TONNY
Optra E210	\$129.00	\$59.00
Optra E310	\$225.00	\$69.00
Optra E/E+	\$135.00	\$59.00
X215	\$105.00	\$59.00

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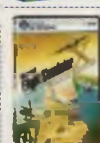
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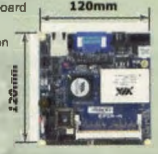
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- VIA Luke CoreFusion™ Processor onboard with Integrated UniChrome™ Pro AGP graphics w/MPEG2/MPEG4 Acceleration
- DDR 266/333/400 (SODIMM)
- 1 Mini-PCI slot
- VIA Vinyl 6 Channel Audio
- 6 USB 2.0 ports
- VIA 10/100 LAN
- VIA TV Out (HDTV)
- LVDS/DVI (optional)
- Nano-ITX (120mm x 120mm)
- Digital Media and Mobile Entertainment



Model: EPIA-N



- All in One
- VIA C7™/Eden™ Processor onboard with Integrated UniChrome™ Pro AGP graphics w/MPEG-2 acceleration
- DDRII 400/533
- 1 PCI slot
- Vinyl 6 channel Audio
- IEEE 1394 Firewire
- 6 USB 2.0 ports
- 2 COM ports
- LAN Controller
- TV Out (HDTV)
- LVDS/DVI (optional)
- Mini-ITX (170mm x 170mm)
- Digital Media, Entertainment, Set Top Box



Model: EPIA-EN



Powerful and Flexible Digital Media

- All in One
- VIA C7™ Processor onboard with Integrated UniChrome™ Pro AGP graphics w/MPEG-2 acceleration
- DDRII 400/533
- 1 PCI slot
- Vinyl 6 channel Audio
- 8 USB 2.0 ports
- 1 COM port
- 10/100 LAN
- TV Out
- Mini-ITX (170mm x 170mm)
- KIOSK, Thin Client



Model: EPIA-CN



- All in One
- VIA C3™/Eden™ Processor onboard with Integrated UniChrome AGP graphics w/MPEG-2 Acceleration
- DDR 266
- CardBus/CompactFlash Support
- 1 PCI slot, 1 Floppy Connector
- Vinyl 6 channel Audio
- IEEE 1394 Firewire
- 4 USB 2.0 ports
- 2 COM ports
- VIA 10/100 LAN
- TV Out
- LVDS/DVI (optional)
- Mini-ITX (170mm x 170mm)
- Wireless Media, Kiosk, Set Top Box



Model: EPIA-MII



Hard Working Small&Quiet Systems

- All in One
- VIA Luke CoreFusion Processor with Integrated UniChrome Pro AGP Graphics with MPEG-2/MPEG-4 Acceleration
- DDR 400 DIMM
- 1 PCI slot
- 2 SATA ports
- VIA Vinyl 6 Channel Audio
- 8 USB 2.0
- 4 COM ports
- 2 VIA 10/100 Ethernet (1 optional Gigabit)
- 1 Digital I/O 4GPI4GPO
- LVDS/DVI (optional)
- Mini-ITX Form Factor (170mmx170mm)
- Always-on Point of Sales Applications



Model: EPIA-EK



Digital Media and Entertainment

- All in One
- VIA C3™/Eden™ with Processor onboard Integrated UniChrome AGP graphics w/MPEG-2 Acceleration
- DDR 266
- 1 PCI slot, 1 Floppy Connector
- Vinyl 6 channel Audio
- IEEE 1394 Firewire
- 4 USB 2.0 ports
- VIA 10/100 LAN
- TV Out
- LVDS/DVI (optional)
- Mini-ITX (170mm x 170mm)
- Digital Media and Entertainment



Model: EPIA-M



19" Mini-ITX Rackmount

Model No.: 7677

- 19" 1U Rackmount
- Internal 3.5HDD x 1
- PCI Expansion Slot x 2
- Slim Type CD / DVD x 1
- 45(H) x 484(W) x 400(D)
- Cooling: 2 x 40mm fans
- Power and HDD indicators
- Mini-ITX (170mm x 170mm)
- Power on/off



19 Inch

Firewall/VPN/Telephony/Telecom/VoIP Network/Security/Military Application

Model No.: C1B

- 19" 1U Rackmount
- Internal 3.5" HDD x 1
- Internal 2.5" HDD x 1
- PCI Expansion Slot x 1
- Slim CD-rom/DVD-rom x 1
- 19"(W) x 13"(D) x 1.75"(H)
- Mini-ITX (170mm x 170mm)
- Cooling: 2 x 40x28mm fans
- Power on/off and system reset
- Power, LAN and HDD indicators



Firewall/VPN/Telephony/Telecom/VoIP Network/Security/Military Application

Model No.: C1E

- 19" 1U Rackmount
- Internal 3.5" HDD x 2
- PCI Expansion Slot x 1
- Slim CD-rom/DVD-rom x 1
- 19"(W) x 14.5"(D) x 1.75"(H)
- Front access USB & LAN ports
- Power LAN and HDD indicators
- Up to 12" x 9.6" ATX size mobo
- Power on/off and system reset
- Cooling: 1 x 97mm blower or 2 x 40x56mm fans



World's Smallest Case

Model No.: 1677

- Color: Black
- Front Port: USB x 2
- Internal 2.5" HDD x 1
- Slim Type CD / DVD x 1
- 60W/80W Power Adaptor
- Nano-ITX (120mm x 120mm)
- Power on/off and system reset
- 82.5mm(H) x 160mm(W) x 163mm(D)



Home Media Center, Set Top Box, Kiosk, Wireless Media

Model No.: 2677

- Color: Black
- Expansion Slot x 1
- Internal 3.5" HDD x 1
- 4cm Cooling Fan x 2
- Slim Type CD / DVD x 1
- 60W/80W Power Adaptor
- Mini ITX (170mm x 170mm)
- Power on/off and system reset
- 63.5mm(H) x 295mm(W) x 272mm(D)



Home Media Center, Set Top Box, Kiosk, Wireless Media

Model No.: 2600

- Color: Black
- Expansion Slot x 1
- Internal 3.5" HDD x 1
- 4cm Cooling Fan x 2
- Slim Type CD / DVD x 1
- 63.5(H) x 295(W) x 272(D)
- Mini ITX (170mm x 170mm)
- 60W/80W Power Adaptor
- Power on/off and System Reset
- USB x 2, Audio x 1, Mic x 1, 1394 x 1, IR Module (Optional)



Set Top Box, Thin Client, Car Entertainment, Smart Mini PC

Model No.: 3677

- Front Port: USB x 2
- Internal 2.5" HDD x 1
- 6cm Cooling Fan x 1
- Slim Type CD / DVD x 1
- 60W/80W Power Adaptor
- Mini ITX (170mm x 170mm)
- Power on/off and system reset
- 65mm(H) x 210mm(W) x 275mm(D)



Set Top Box, Thin Client, Car Entertainment, Smart Mini PC

Model No.: 3688

- Front Port: USB x 2
- Internal 2.5" HDD x 1
- 6cm Cooling Fan x 1
- Slim Type CD / DVD x 1
- 60W/80W Power Adaptor
- Mini ITX (170mm x 170mm)
- Power on/off and system reset
- 65mm(H) x 210mm(W) x 258mm(D)



Stylish Cube Entertainment centers

Model No.: 669

- Expansion Slot x 2
- Internal 3.5" HDD x 1
- 4cm Cooling Fan x 2
- External 3.5" HDD x 1
- External 5.25" HDD x 2
- 200W ATX Power Supply
- Mini-ITX (170mm x 170mm)
- USB2.0 x 2, 1394/Audio/Mic x 1
- 200mm(H) x 225mm(W) x 330mm(D)





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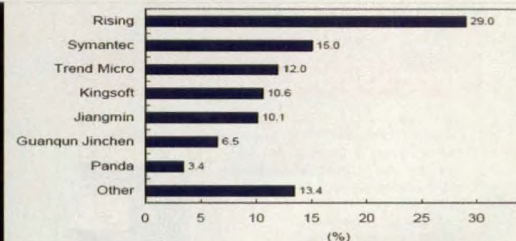


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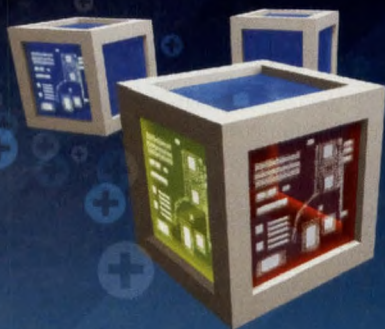
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T008/T018/T027/T029/T039	\$10
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T0491-T0496	\$7.4 ea
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TN6600	\$65
TN7600	\$65
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EPA	\$50
EP25	\$55
EP26	\$70
E30/E31	\$80
CartU	\$80
CartW	\$80
CartN	\$110

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109R725	\$70
PE220	\$80

Compatible Toner for Lexmark

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X215	\$75

Compatible Toner for HP

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C4092A	\$55
C4096A	\$60
C7115X	\$60
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Q1339A	\$145
Q2610A	\$80
Q2612A	\$85
Q2613A	\$85
Q5949X	\$70
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Cat 1008272



Cat 1008265

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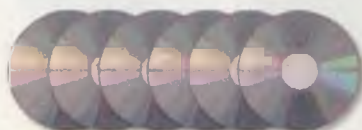
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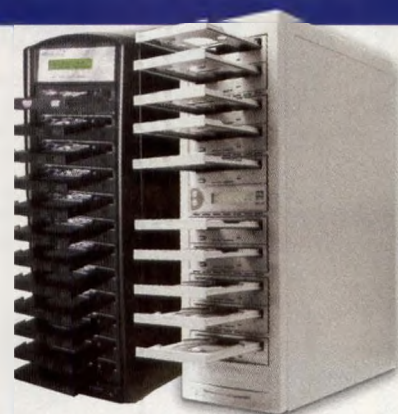
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- **SIMPLE** No PC required. Compact and fully standalone



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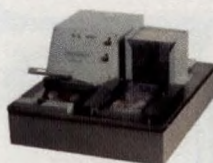
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